

# ***SERVICE MANUAL***

**AMIGA COMPUTER  
MODEL 1000  
*Preliminary*  
COMPONENT LEVEL REPAIR  
PN 314038-02**



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COMPONENT LEVEL REPAIR  
PN 314038-02**

**Commodore-Amiga, Inc.**  
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## **OVERVIEW**

The AMIGA computer is a high-performance system with advanced graphics and audio features. The Functional Block Diagram on page 4 illustrates the relationship of the various circuits on the Main Logic board and Piggyback. The principle hardware features consist of the 68000 microprocessor which runs at 7.2 MHz, 256K bytes of RAM (user expandable to 512K, configurable to 8M), 2 parallel I/O chips and 3 custom VLSI chips that provide the unique capabilities for animation, graphics and sound.

### **68000 MICROPROCESSOR**

The 68000 is the CPU of the system. All other resources are under software control via control data issued from it. All 3 custom chips have control registers that are written by the 68000.

The 68000 communicates with the rest of the computer via its address bus, data bus and control lines. Notice that in the block diagram the 3 custom chips do not reside directly on the 68000 buses. When the 68000 starts a bus cycle that is intended for the custom chips or the display RAM, the bus control logic detects whether or not the display RAM buses are available. The bus control logic will not assert the acknowledge signal (/DTACK) back to the 68000 until the display RAM buses are available. Once the 68000 receives /DTACK it completes the bus cycle. Connecting the display RAM buses to the 68000 buses is discussed further in the section on bus control and multiplexers. Because the display RAM is capable of approximately twice the bandwidth of the 68000, the 68000 is usually not delayed by waiting for the display buses to become available.

The 68000 can fetch instructions from:

- Boot ROM
- Processor RAM
- Display RAM

The 68000 can read and write data directly to:

- Boot ROM (Read Only)
- Processor RAM (After boot this is Read Only)
- Display RAM
- Parallel I/O Chips
- 3 Custom I.C.s

The 68000 transmits data and control to and from the peripherals via the parallel I/O and the 3 custom chips.

7M is the processor clock to the 68000. C1-C4 and /DAC are used to clock the custom chips and for determining the timing of signals to the memory arrays.

### **BOOT ROM**

The boot ROM is comprised of 2 standard 32K byte ROMS configured in parallel to form a 32K word that includes the routines for bringing in additional code from the floppy disk.

## **PROCESSOR RAM**

This 256K byte RAM is intended to hold kernal and DOS routines. It has associated logic which allows it to be write protected once it has been loaded. This allows it to function as ROM once the boot load has been completed. Except during the boot sequence, "writes" to this RAM are prevented.

This RAM and its associated buffers and logic are resident on the piggyback board (daughter card), which is attached to the main board.

## **PARALLEL I/O**

The 2 multi-purpose 8520 I/O chips provide the following:

- I/O to and from the parallel port connector
- Control lines to and from the joystick/mouse ports
- A control line to the front panel LED
- Internal control lines
- Keyboard control lines, clock and data
- Serial port control lines
- Floppy disk interface control lines
- Internal timers

These 2 chips reside on the 68000 buses and are read and written by the 68000.

## **CLOCKS GENERATOR**

The entire computer board is run synchronous to the 3.579545 MHz color clock. This is accomplished by generating a number of submultiple frequencies from the master 28.31818 MHz crystal oscillator. In order to reduce high frequency radiation, all clock generation is done in the small metal RF can on the main logic board. The following are the primary clocks:

C1	3.579545 MHz color clock
C2	C1 shifted 45 degrees later
C3	C2 shifted 45 degrees later
C4	C3 shifted 45 degrees later
7M	C1 XORed with C3 = 7.15909 MHz
/DAC	7M shifted 90 degrees later

## **THE 3 CUSTOM CHIPS**

The 3 custom chips provide very fast manipulation of graphics and audio data in the display RAM. All of the major functions in the chips are DMA driven; that is, streams of data are moved between the custom chips and display RAM under DMA control. These streams of data are acted upon by the custom chips. Agnus, custom chip #1, contains 25 dedicated purpose DMA counters.

The 3 chips have control registers which are usually loaded by the 68000. However, Agnus also has the capability of loading control registers in the other 2 custom chips. When Agnus performs a bus cycle, it outputs a code on the Register Address Bus telling the other 2 chips the nature of the bus cycle. This is necessary because many of the bus cycles provide data to or from the other 2 chips, thus they must cooperate appropriately.

In addition to manipulating data in the display RAM, the custom chips output streams of data to the video output circuits, audio output circuits and move data to and from the floppy disks and serial port.

Note that the display RAM buses can be completely isolated from the 68000 buses by the multiplexers and drivers. Thus, Agnus can be performing a bus cycle on the display buses simultaneously with the 68000 performing a bus cycle on its buses. This parallelism increases throughput.

## **BUS CONTROL, ADDRESS/DATA MUX, ADDRESS DRIVER**

The bus control logic resides primarily in 4 PALs on the piggyback board. They provide the logic for connecting the 68000 buses to the display RAM buses when the 68000 is attempting to access the display RAM or the custom chips. To do this, the bus control logic must perform 3 major functions:

- Synchronize the 68000 to the current phase of C1
- Arbitrate between the 68000 and Agnus for the display buses
- Turn on the muxes and bus drivers appropriate to the current cycle

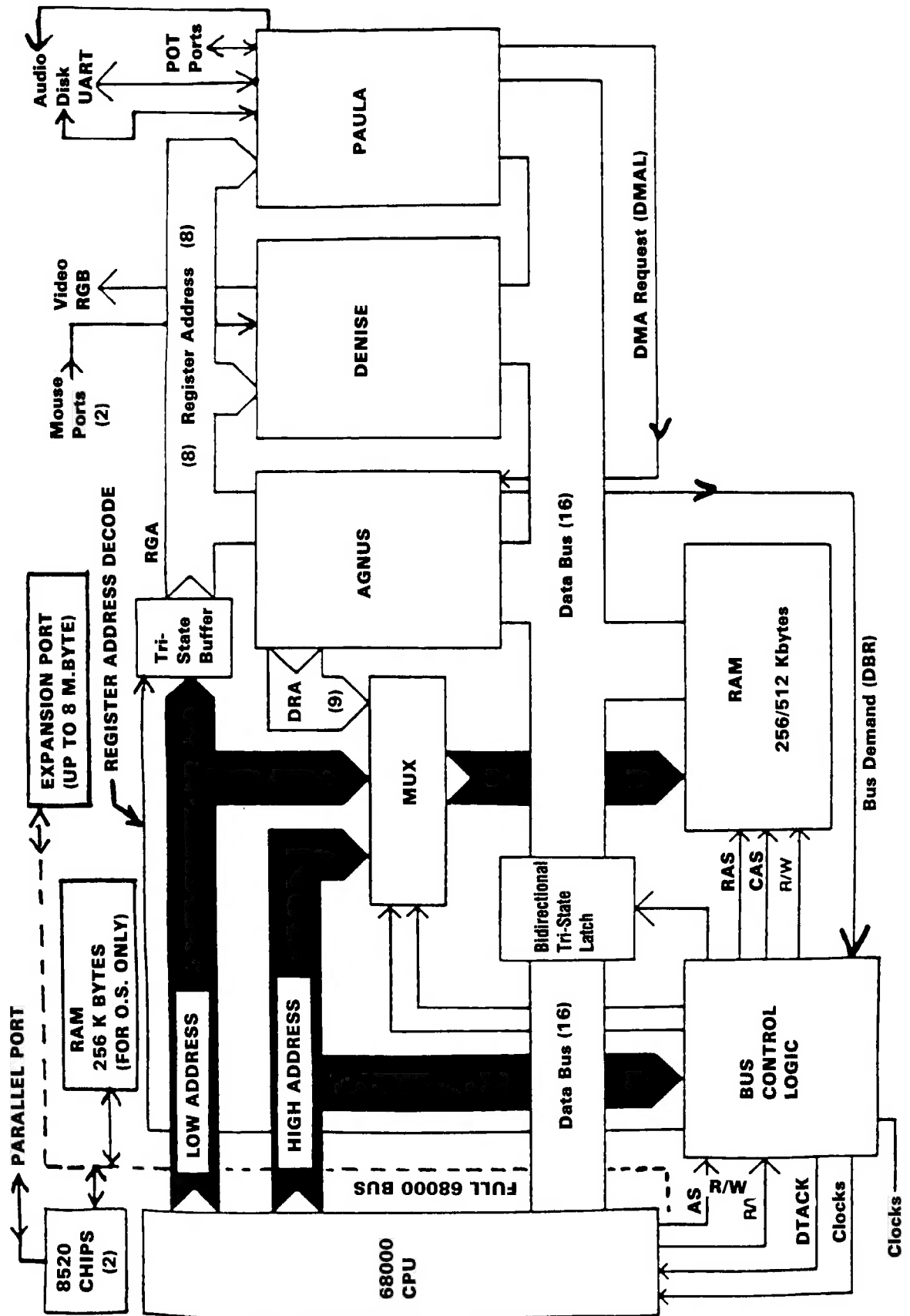
Synchronizing the 68000 to C1 is straightforward, since the 68000 is clocked by 7M which is twice the frequency and synchronous to C1. If the 68000 starts a bus cycle in the wrong phase of C1, the bus control logic merely delays /DTACK long enough so that the 68000 will complete the bus cycle in the desired phase relationship to C1. This phase relationship is necessary because the custom chips and the display RAM are clocked by C1.

Arbitration is very simple. Agnus tells the bus control prior to taking the display RAM buses by asserting an input to the PALs called /DBR. Whenever Agnus has the display buses and the 68000 wants them, the 68000 is held off by not giving it /DTACK. In this state the 68000 has no affect on the display buses until the bus controller enables the bus drivers and multiplexers, after Agnus has given up the display buses.

## **DISPLAY RAM**

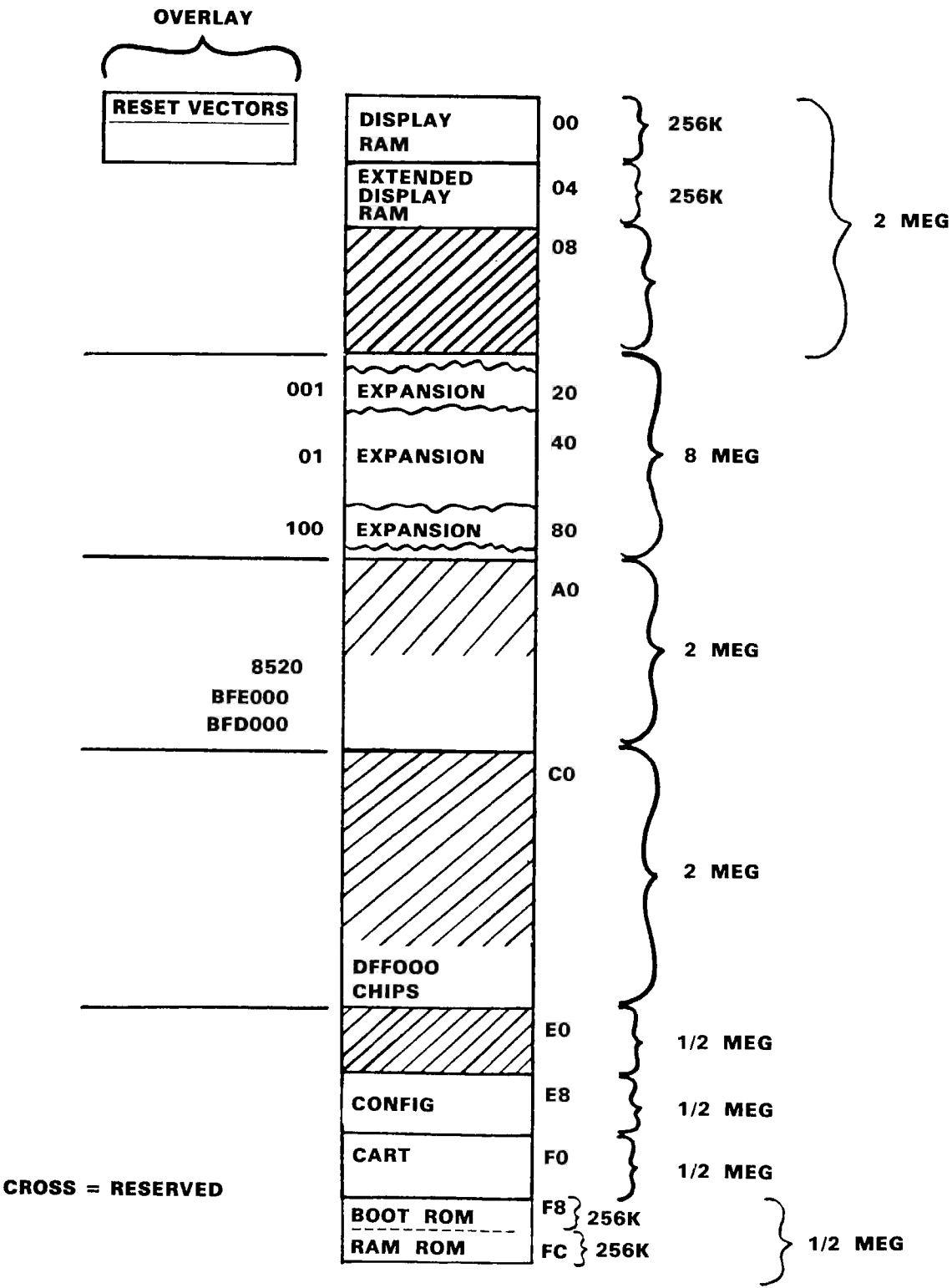
The display RAM is an ordinary 256K byte read/write memory that resides on the RAM address and RAM data buses. It is expandable to 512K bytes by the addition of the RAM expansion module. It is implemented using standard dynamic RAMs, refreshed by Agnus.

The display RAM is really used for much more than just holding graphics data. It also stores code and data for the 68000.



## AMIGA SYSTEM BLOCK DIAGRAM

# ADDRESS MAP



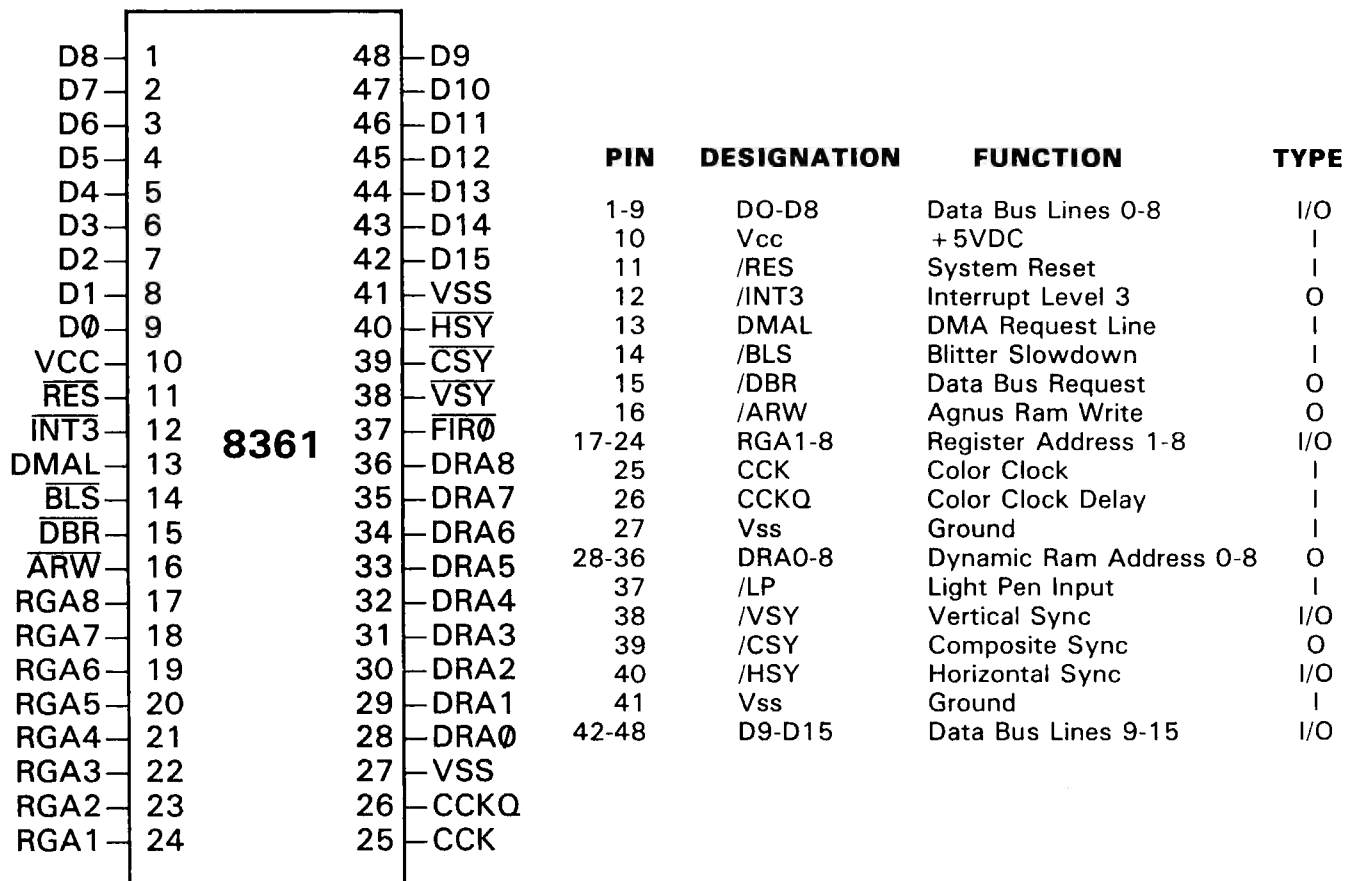


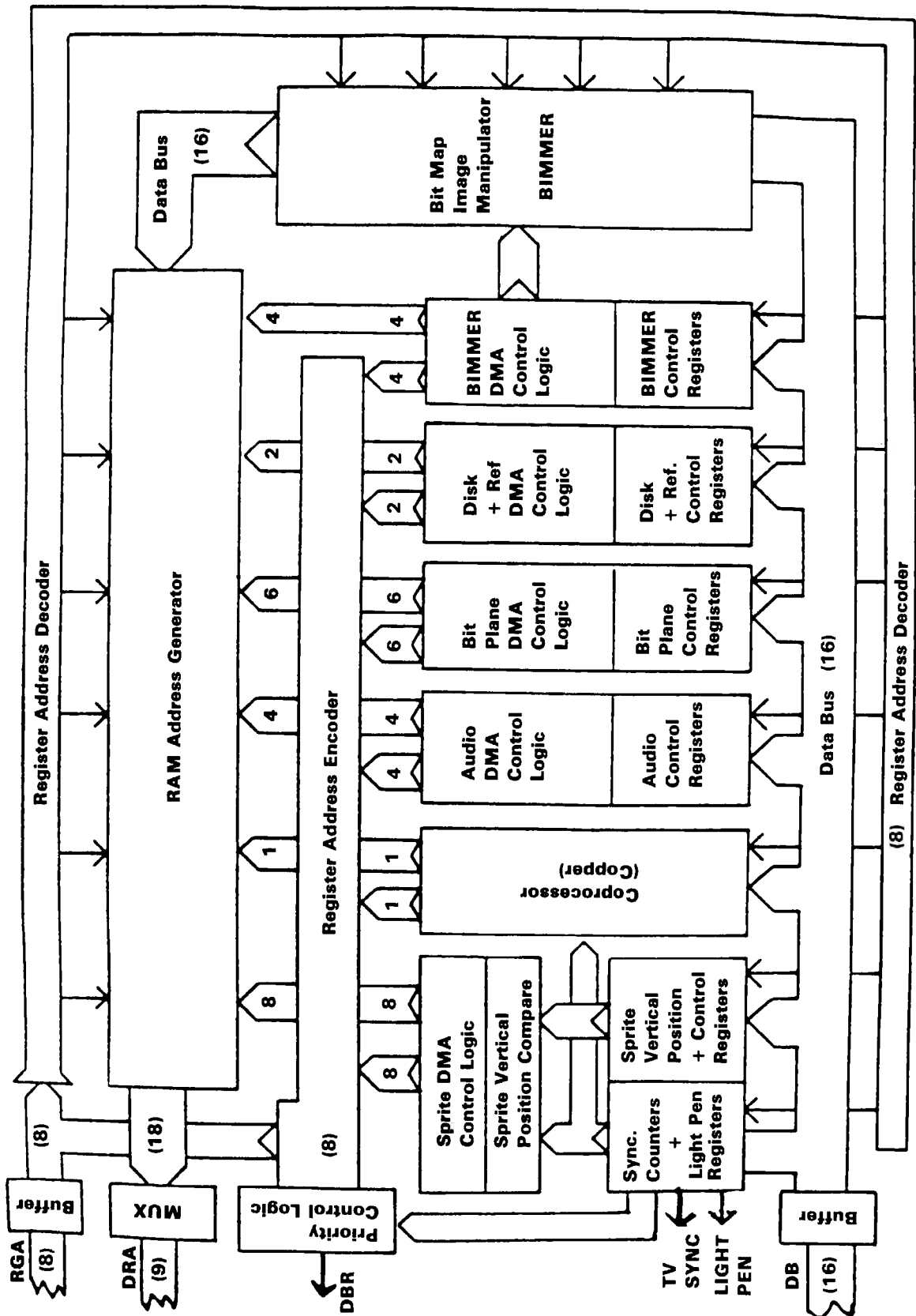
# CUSTOM ANIMATION CHIP

## — Agnus —

### FEATURES:

- Bit Blitter — Uses Hardware to Move Display Data — Allows High Speed Animation — Frees the CPU for other Concurrent Tasks
- Display Synchronized Coprocessor
- Controls 25 DMA Channels — Allows the Disk and Sound to Operate with Minimal CPU intervention





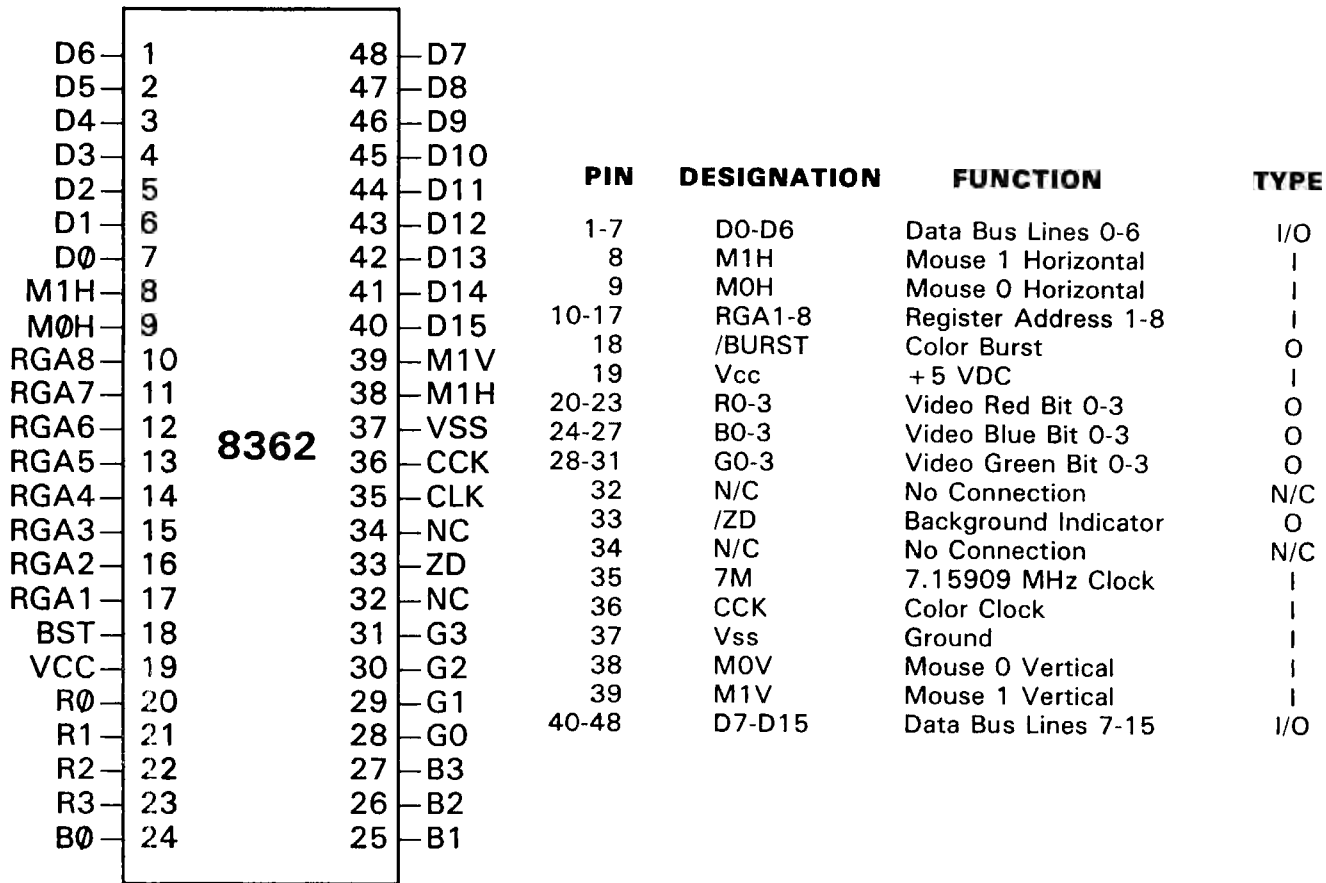
## AGNUS BLOCK DIAGRAM

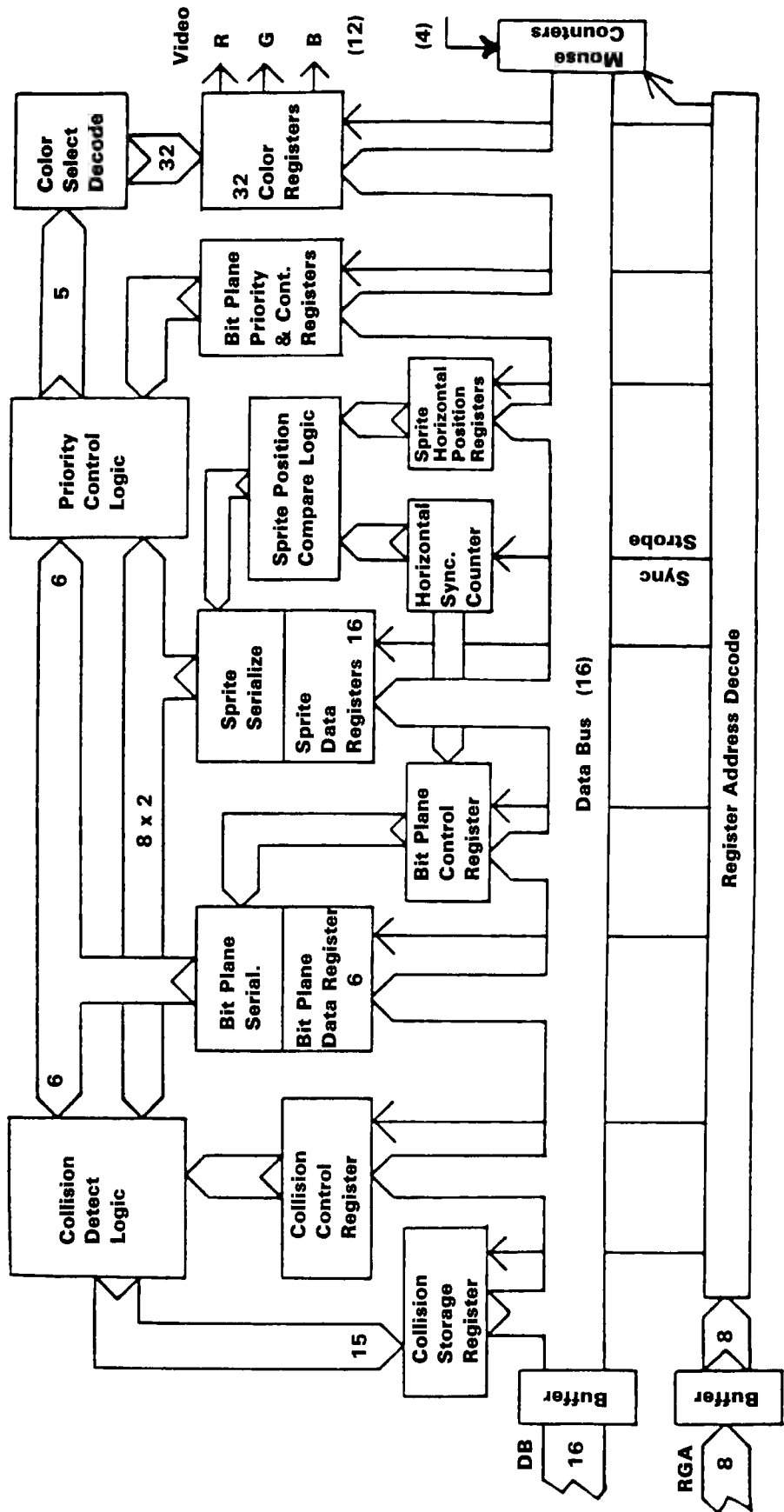
# CUSTOM GRAPHICS CHIP

— Denise —

## FEATURES:

- Many Different Resolutions 320 X 200 up to 640 X 400
- 4096 Colors on a TV or RGB Monitor
- Eight Re-usable Sprite Controllers
- 60 or 80 Column Text
- Same Software for All TVs and Monitors





DENISE BLOCK DIAGRAM

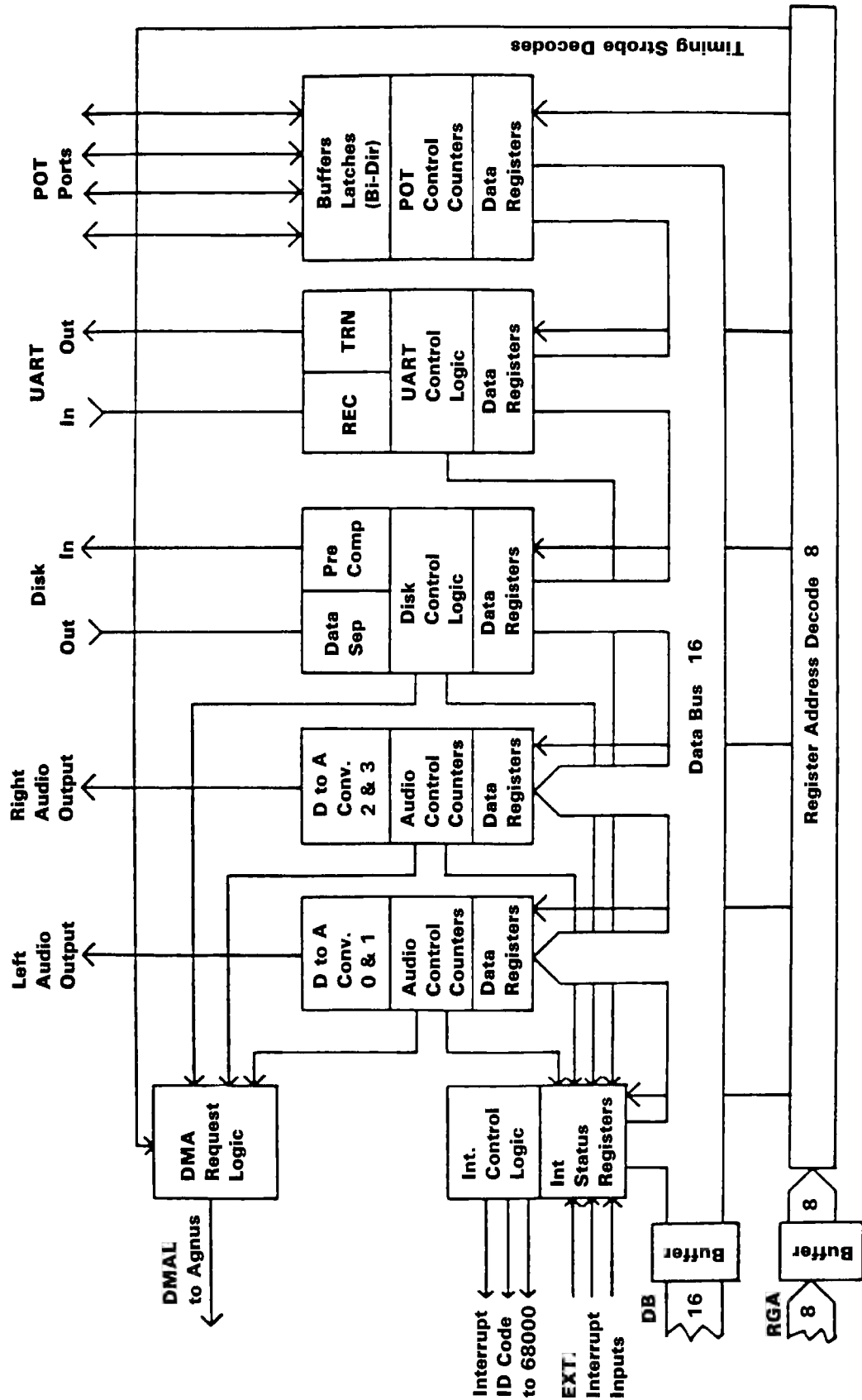
# CUSTOM SOUND/PERIPHERALS CHIP

— Paula —

## FEATURES:

- Four Voices of Sound Output configured as Two Stereo Channels
- Nine Octaves
- Complex Waveforms
- Uses both Amplitude and Frequency Modulation
- I/O Controls for Disk Data and Controller Ports
- Microdisk Controller
- Interrupt Control System

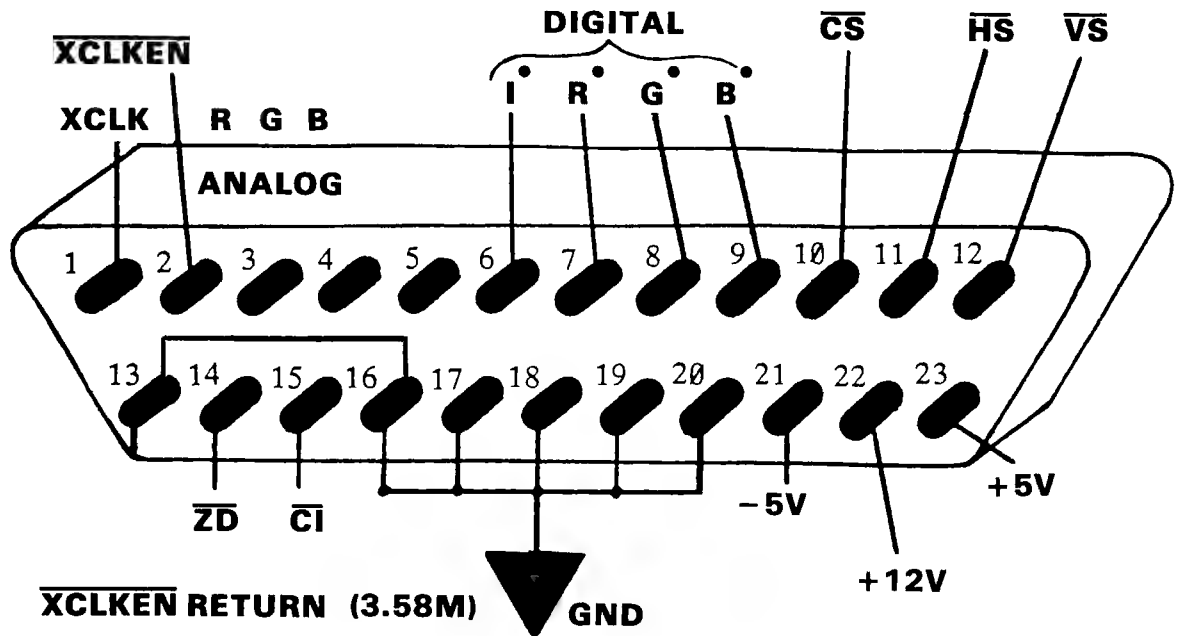
D8	1	48	D9				
D7	2	47	D10	PIN	DESIGNATION	FUNCTION	TYPE
D6	3	46	D11	1-7	D2-D8	Data Bus Lines 2-8	I/O
D5	4	45	D12	8	Vss	Ground	I
D4	5	44	D13	9,10	D0,D1	Data Bus Lines 0,1	I/O
D3	6	43	D14	11	/RES	System Reset	I
D2	7	42	D15	12	DMAL	DMA Request Line	O
VSS	8	41	RXD	13-15	/IPLO-2	Interrupt Line 0-2	O
D1	9	40	TXD	16-18	/INT2,3,6	Interrupt Level 2,3,6	I
D0	10	39	DKWB	19-26	RGA1-8	Register Address 1-8	I
RES	11	38	DKWD	27	Vcc	+ 5 VDC	I
DMAL	12	37	DKRD	28	CCK	Color Clock	I
IPL0	13	36	P1Y	29	CCKQ	Color Clock Delay	I
IPL1	14	35	P1X	30	AUDB	Right Audio	O
IPL2	15	34	ANAGND	31	AUDA	Left Audio	O
INT2	16	33	P0Y	32	POT0X	Pot 0X	I/O
INT3	17	32	P0X	33	POT0Y	Pot 0Y	I/O
INT6	18	31	AUDA	34	VSSANA	Analog Ground	I
RGA8	19	30	AUDB	35	POT1X	Pot 1X	I/O
RGA7	20	29	CCKQ	36	POT1Y	Pot 1Y	I/O
RGA6	21	28	CCK	37	/DKRD	Disk Read Data	I
RGA5	22	27	VCC	38	/DKWD	Disk Write Data	O
RGA4	23	26	RGA1	39	DKWE	Disk Write Enable	O
RGA3	24	25	RGA2	40	TXD	Serial Transmit Data	O
				41	RXD	Serial Receive Data	I
				42-48	D9-15	Data Bus Lines 9-15	I/O



PAULA BLOCK DIAGRAM

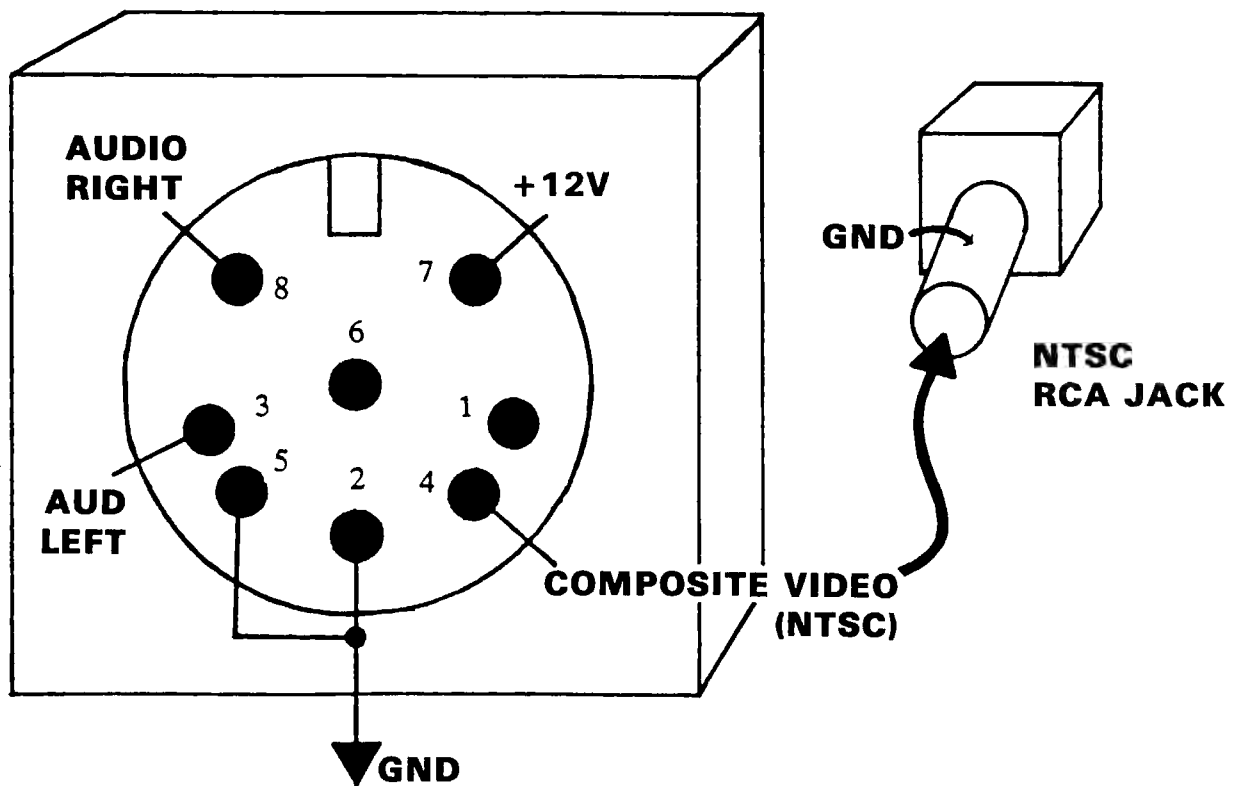
# VIDEO CONNECTORS

## — J3 RGB —



PIN	LINE	FUNCTION
1	/XCLK	External Clock Input
2	/XCLKEN	External Clock Enable
3	R	Analog Red
4	G	Analog Green
5	B	Analog Blue
6	I	Digital Intensity
7	R	Digital Red
8	G	Digital Green
9	B	Digital Blue
10	/CS	Composite Sync — Active Low
11	/HS	Horizontal Sync — Active Low
12	/VS	Vertical Sync — Active Low
13	GNDRTN	Return for XCLKEN
14	/ZD	Zero Detect — Active Low
15	/C1	Color Clock 3.58 MHz
16-20	GND	Ground
21	-5V	- 5 VDC Power
22	+12V	+ 12 VDC Power
23	+5V	+ 5 VDC Power

## J2 COMPOSITE

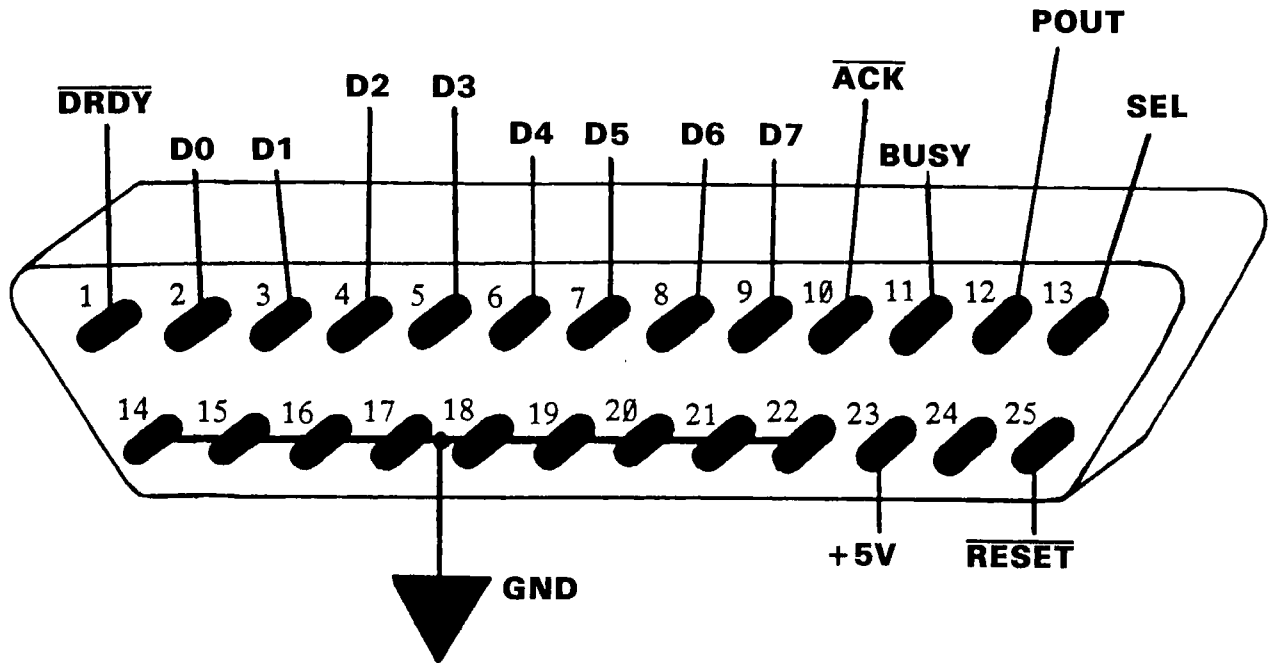


**Requires MODULATOR for 8-pin DIN composite video output.**



# PARALLEL PORT

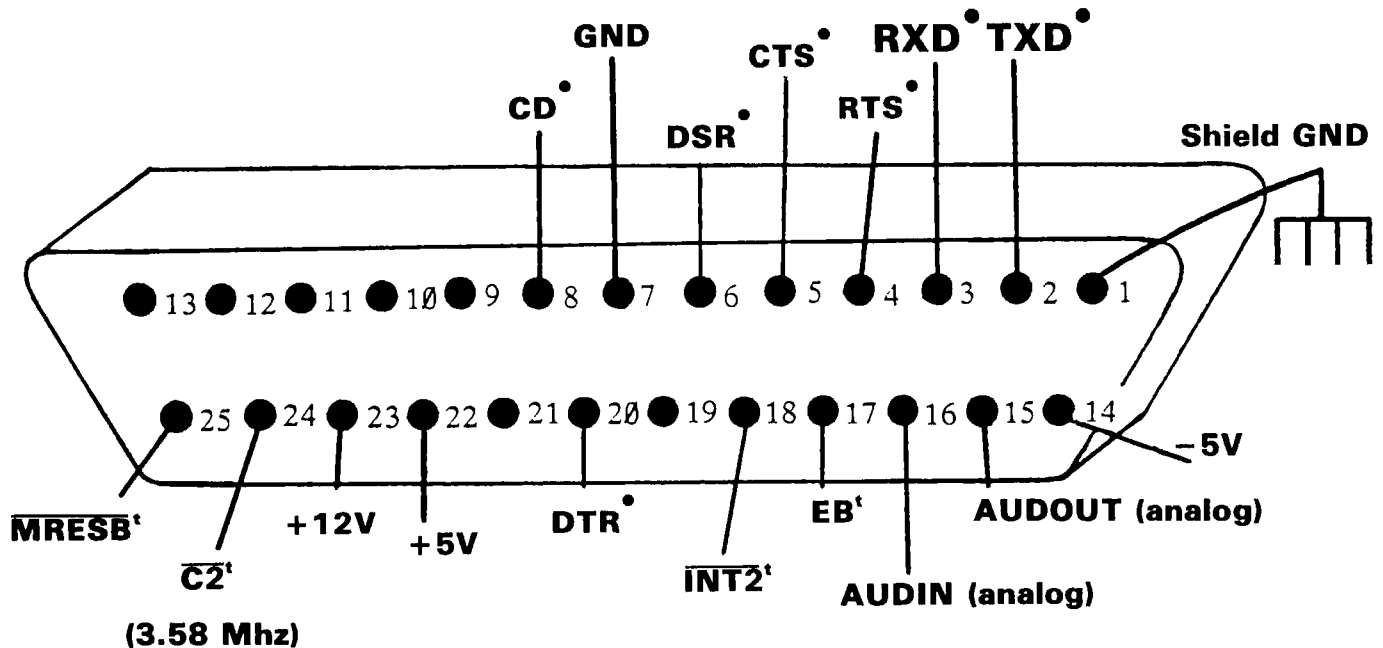
— J8 —



PIN	LINE	FUNCTION
1	/DRDY	Data Ready — Active Low
2-9	D0-D7	Data Lines 0-7
10	/ACK	Acknowledge — Active Low
11	BUSY	Busy
12	POUT	Paper Out
13	SEL	Select
14-22	GND	Signal Ground
23	+5	5 VDC Supply
24	N/C	
25	/RESET	Reset — Active Low

# SERIAL PORT

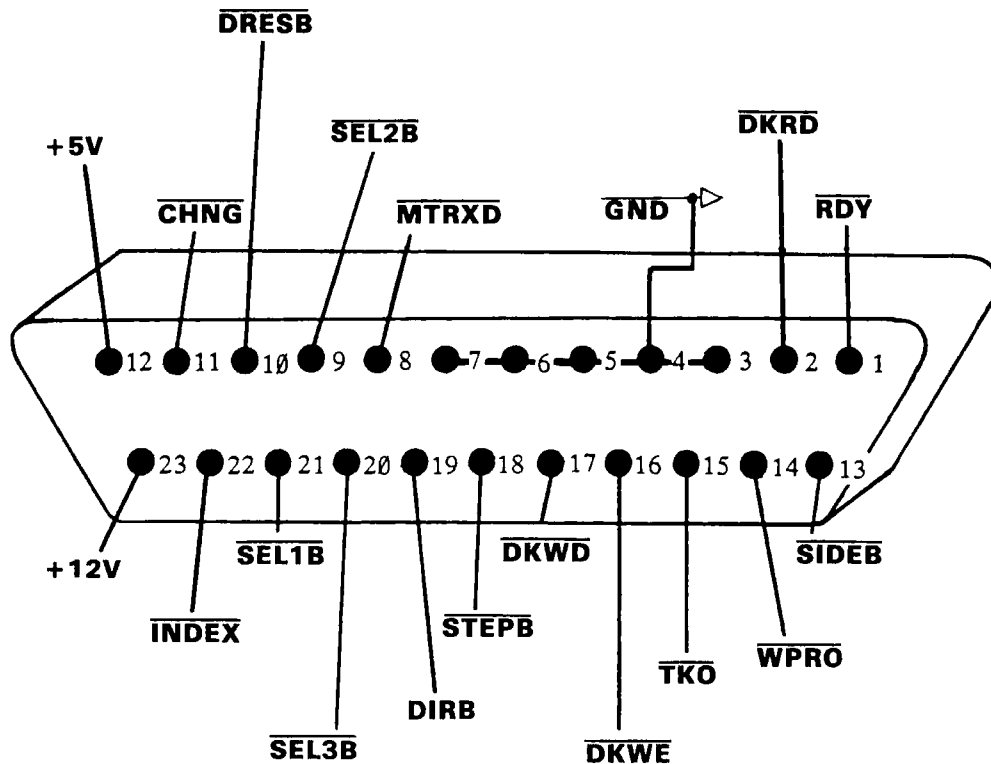
— J6 —



PIN	LINE	FUNCTION
1	GND	Frame Ground
2	TXD	Transmit Data
3	RXD	Receive Data
4	RTS	Request to Send
5	CTS	Clear to Send
6	DSR	Data Set Ready
7	GND	System Ground
8	CD	Carrier Detect
9-13	N/C	
14	- 5V	- 5 VDC Power
15	AUDOUT	Audio Out of Amiga
16	AUDIN	Audio Into Amiga
17	EB	Buffered Port Clock 716KHz
18	/INT2	Interrupt Line to Amiga
19	N/C	
20	DTR	Data Terminal Ready
21	N/C	
22	+ 5V	+ 5 VDC Power
23	+ 12V	+ 12 VDC Power
24	/C2	3.58MHz Clock
25	MRESB	Buffered System Reset

## EXTERNAL DISK CONNECTOR

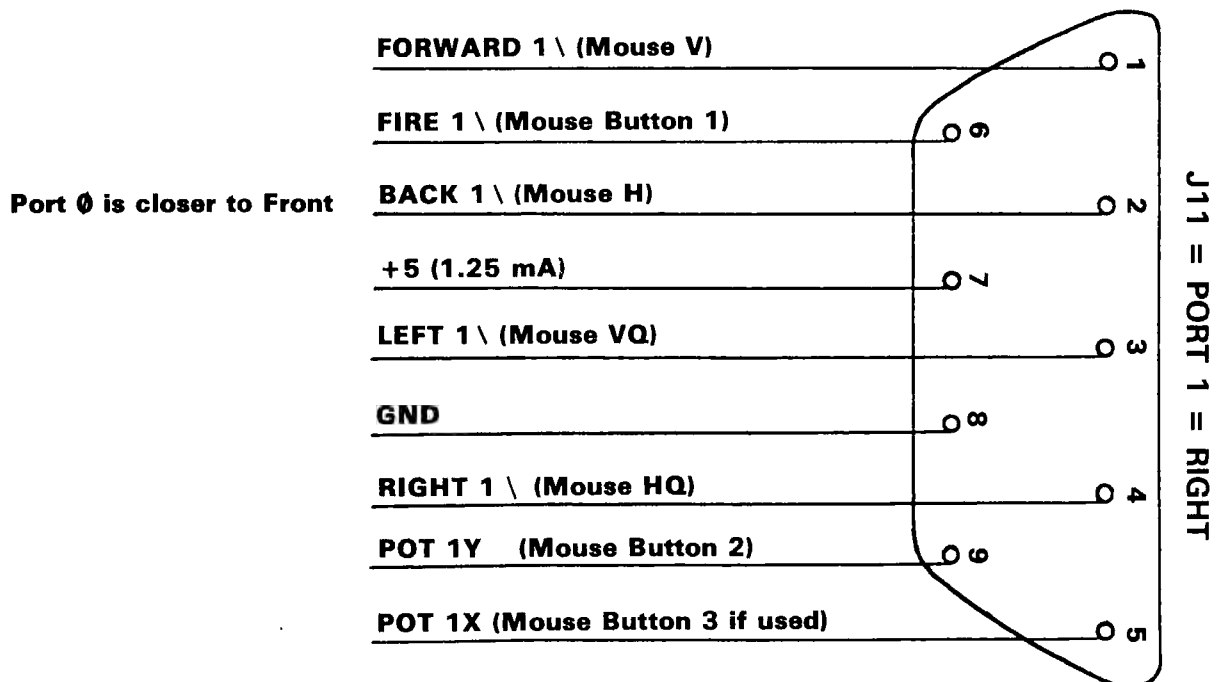
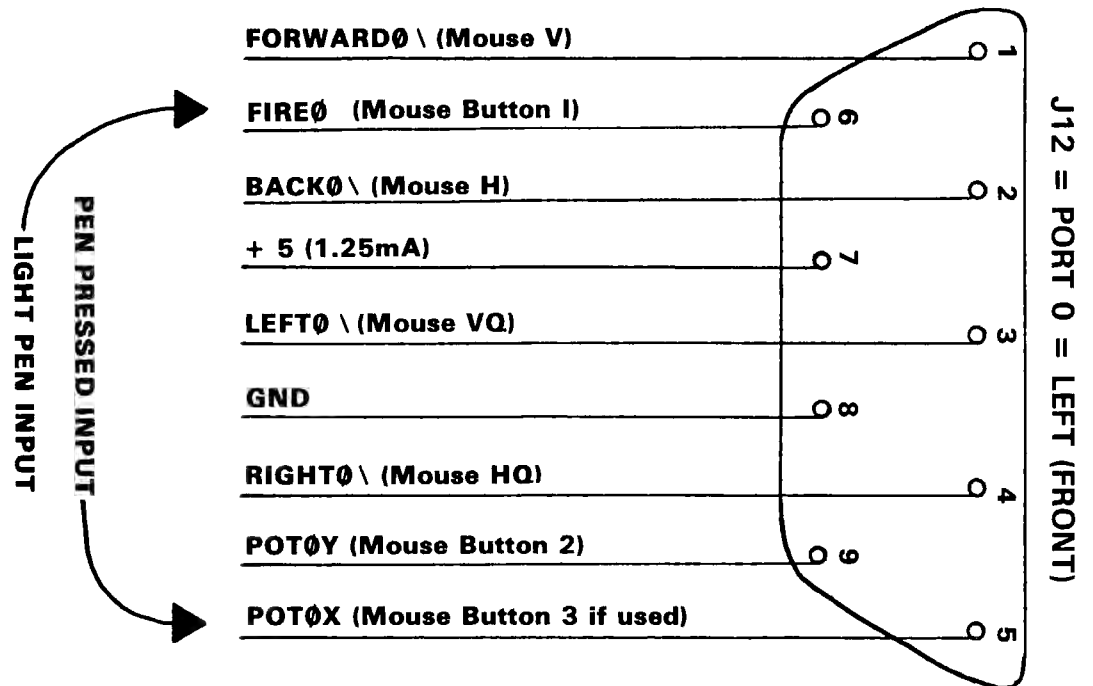
— J7 —

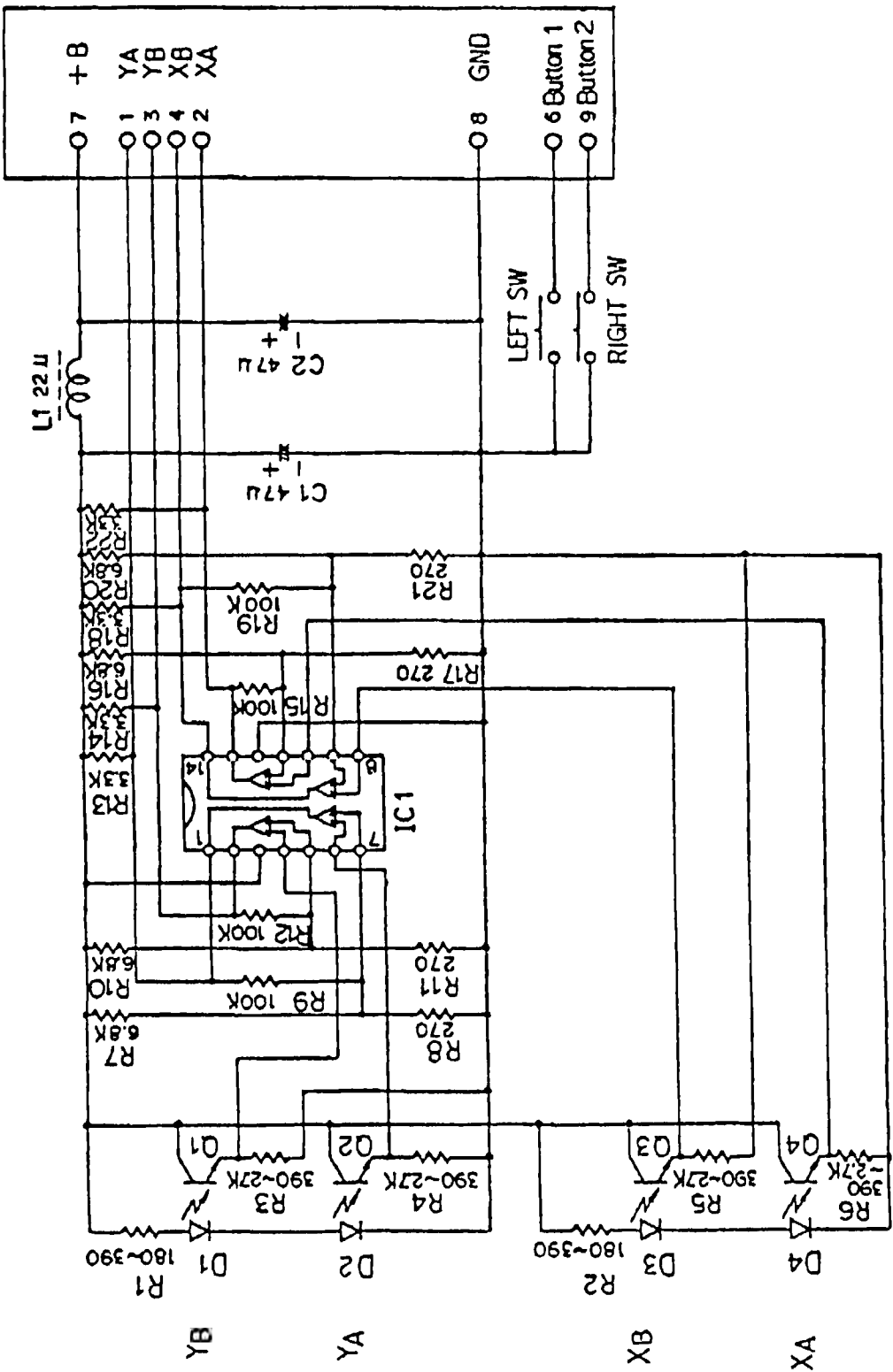


PIN	LINE	FUNCTION
1	/RDY	Disk Ready — Active Low
2	/DKRD	Disk Ready Data — Active Low
3-7	GND	Ground
8	/MTRXD	Disk Motor Control — Active Low
9	/SEL2B	Select Drive 2 — Active Low
10	/DRESB	Disk RESET — Active Low
11	/CHNG	Disk has been Removed from Drive — Latched Low
12	+5	5 VDC Supply
13	/SIDE B	Select Disk Side — 0=Upper 1=Lower
14	/WPRO	Disk is Write Protected — Active Low
15	/TKO	Drive Head Position over Track 0 — Active Low
16	/DKWE	Disk Write Enable — Active Low
17	/DKWD	Disk Write Data — Active Low
18	/STEPB	Step the Head — Pulse, First Low then High
19	DIRB	Select Head Direction — 0=Inner 1=Outer
20	/SEL3B	Select Drive 3 — Active Low
21	/SEL1B	Select Drive 1 — Active Low
22	/INDEX	Disk Index Pulse — Active Low
23	+12	12 VDC Supply

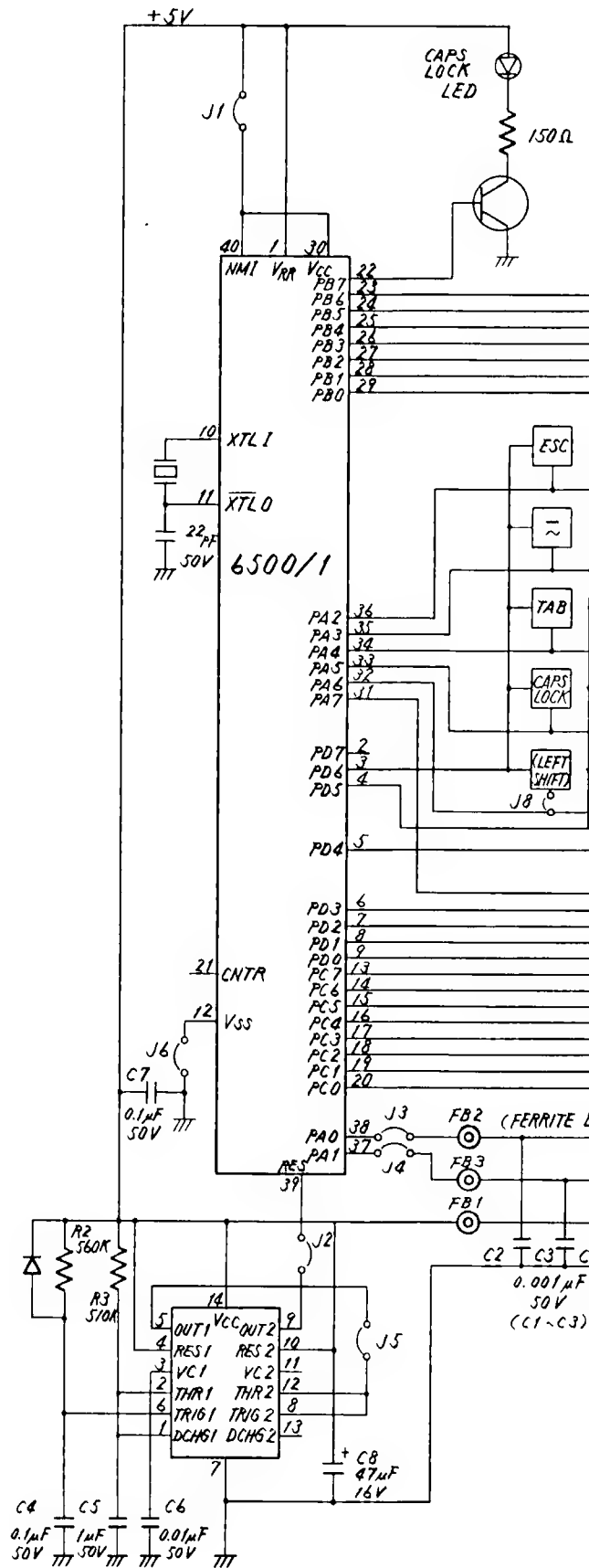
# MOUSE/JOYSTICK/LIGHTPEN PORTS

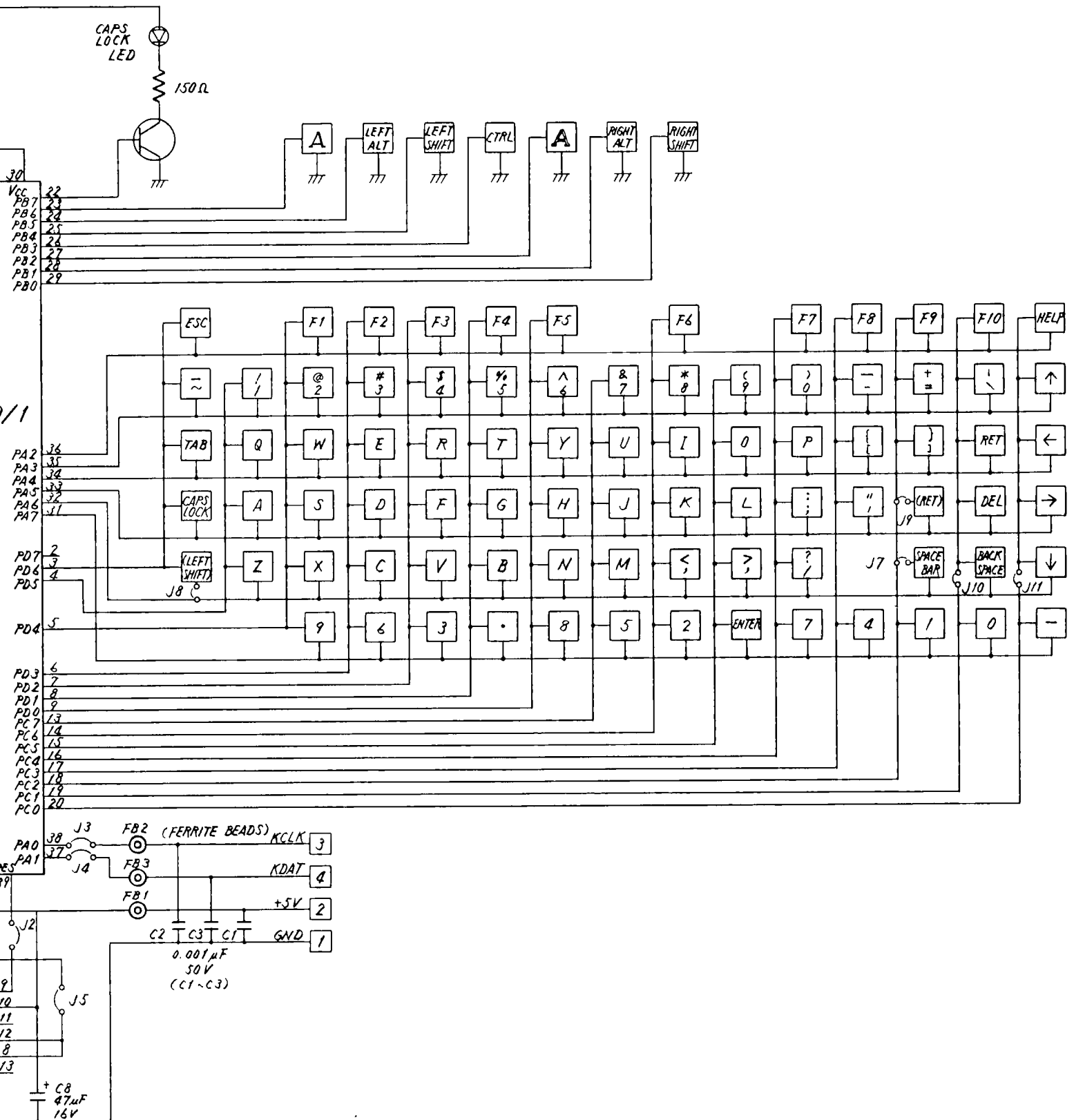
— J11 and J12 —



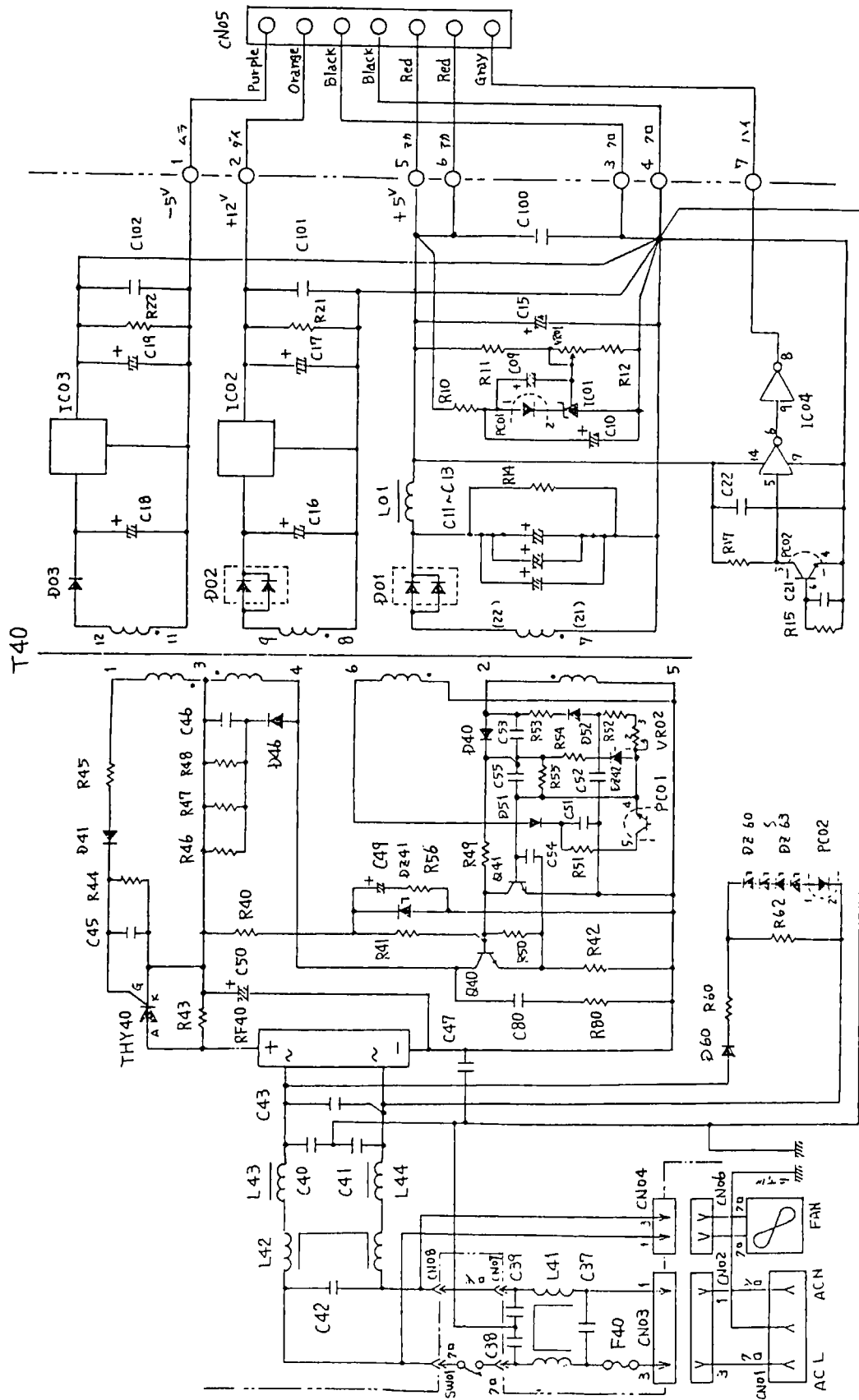


SCHEMATIC  
AMIGA MOUSE ASSY #327124





**SCHEMATIC**  
**AMIGA KEYBOARD ASSY #327063**



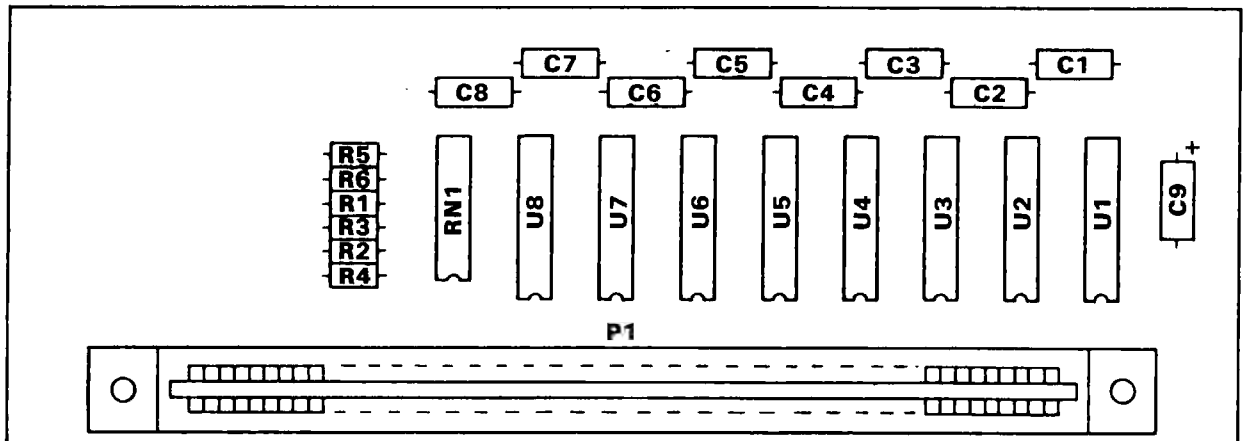
This drawing is provided for reference **ONLY**. It does not imply the serviceability of the Amiga Power Supply. It is the policy of Commodore Business Machines to **REPLACE** a defective power supply due to the unique parts used by the OEM supplier of the unit. UL requirements specify that **EXACT** replacement parts must be used.

**SCHEMATIC**  
**AMIGA POWER SUPPLY ASSY #327173**



# RAM EXPANSION CARTRIDGE

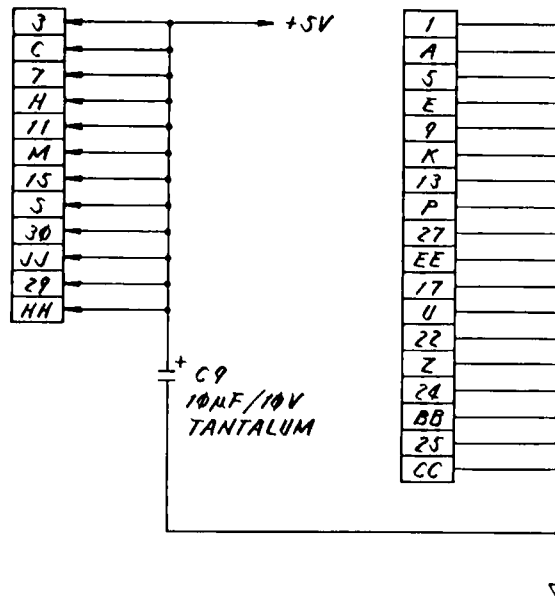
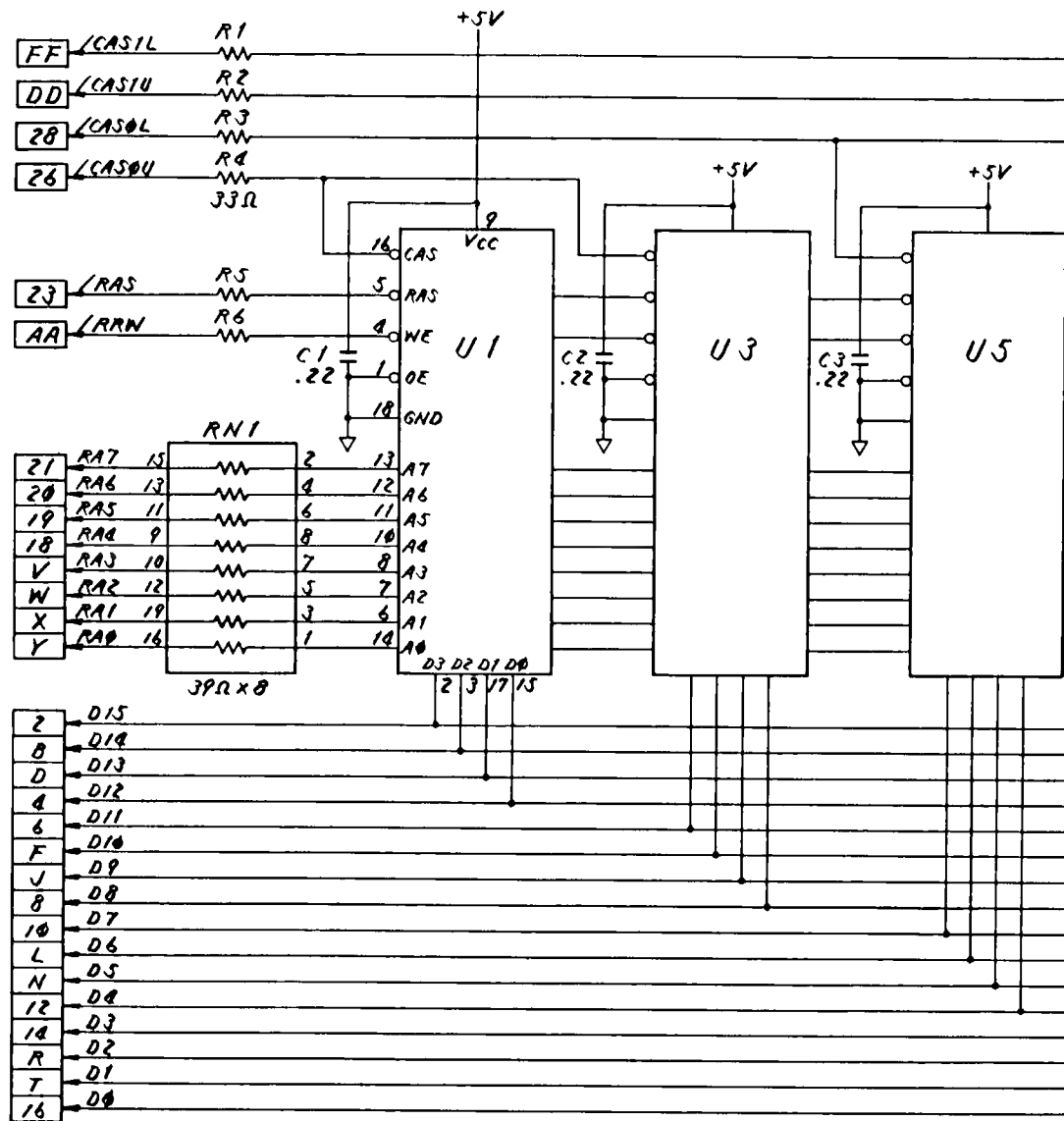
PCB ASSY #327186

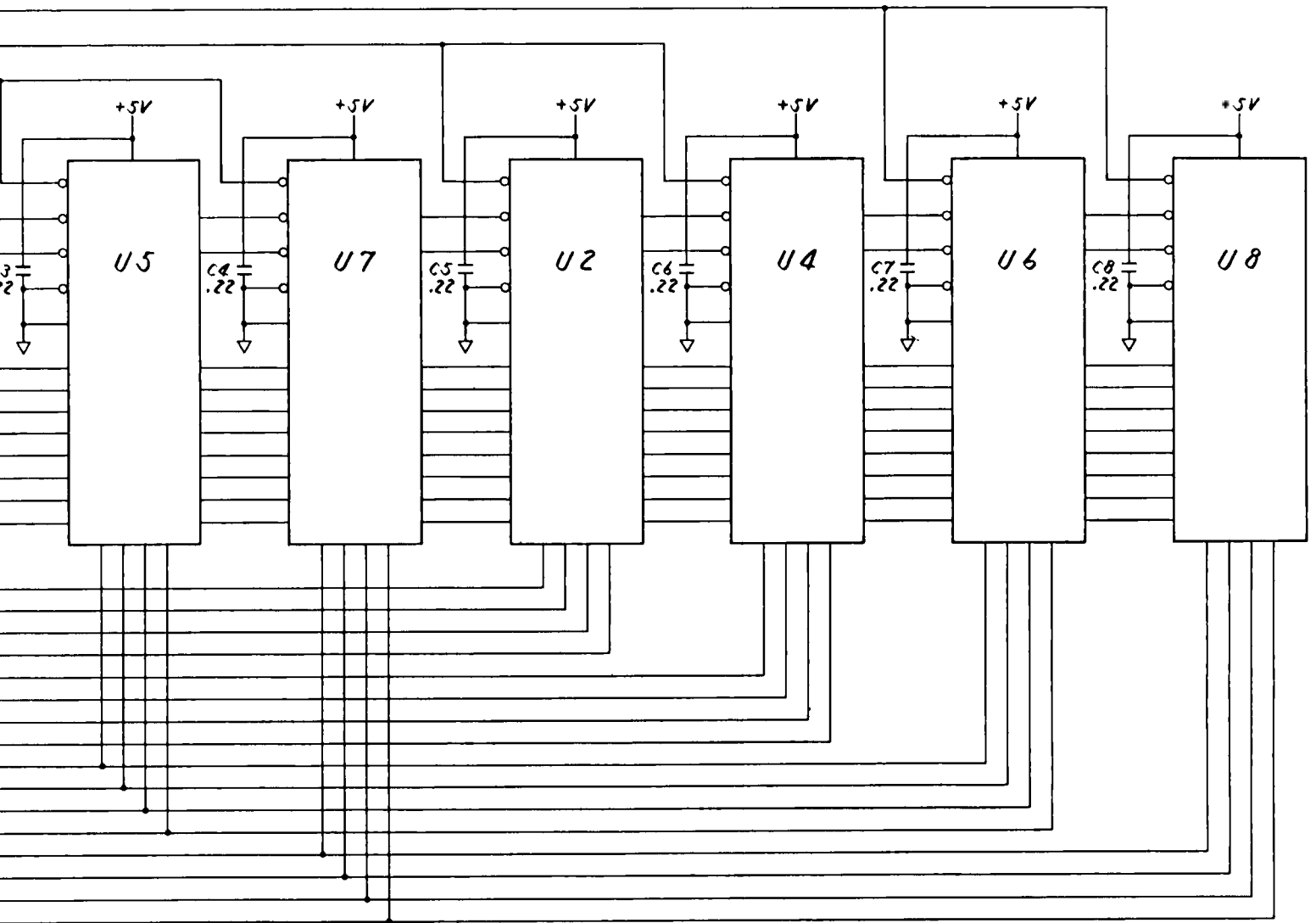


BOARD LAYOUT

## PARTS LIST

U1-8	DRAM 64K x 4 120/150 nS
R1-6	CARBON RESISTOR 33 $\Omega$ 1/4 W 5%
RN1	RESISTOR PACK DIP 8 pin 39 $\Omega$
C1-8 C9	CERAMIC CAPACITOR 0.22 $\mu$ F 50V TANTALUM CAPACITOR 10 $\mu$ F 10V
P1	CARD EDGE CNNCT 3.96 pitch 60 pin





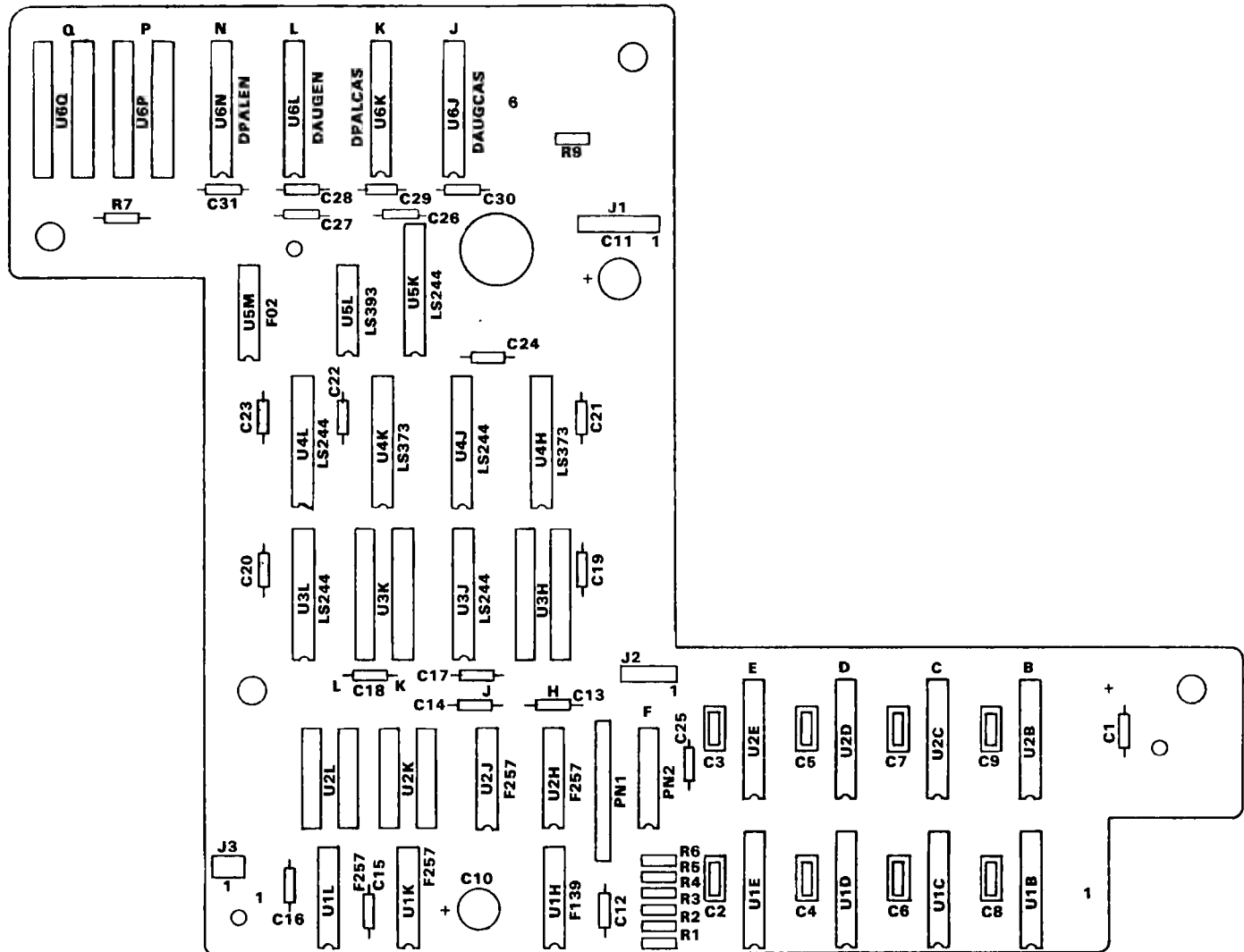
**SCHEMATIC**  
**RAM EXPANSION ASSY #252157**

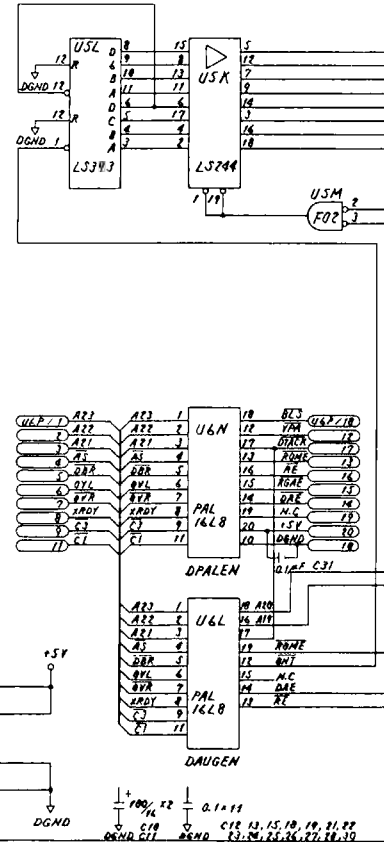
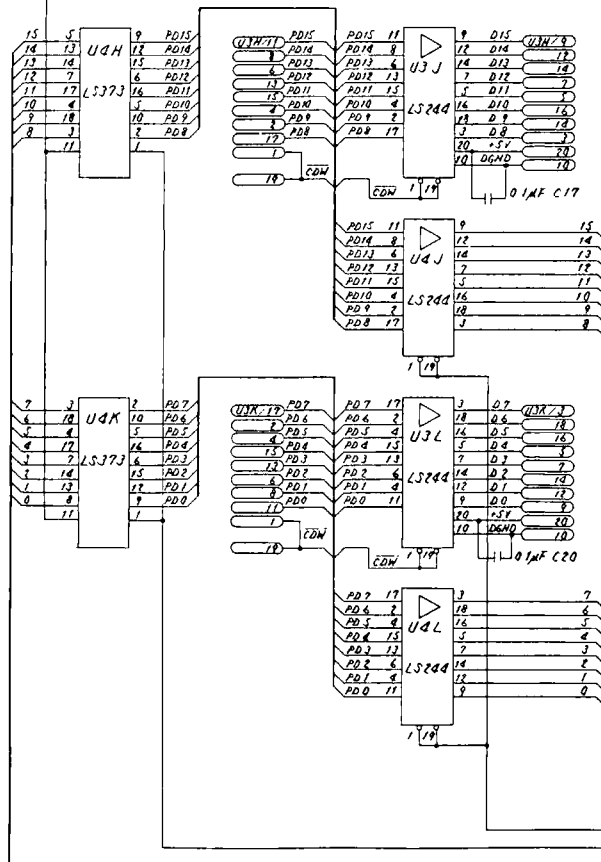
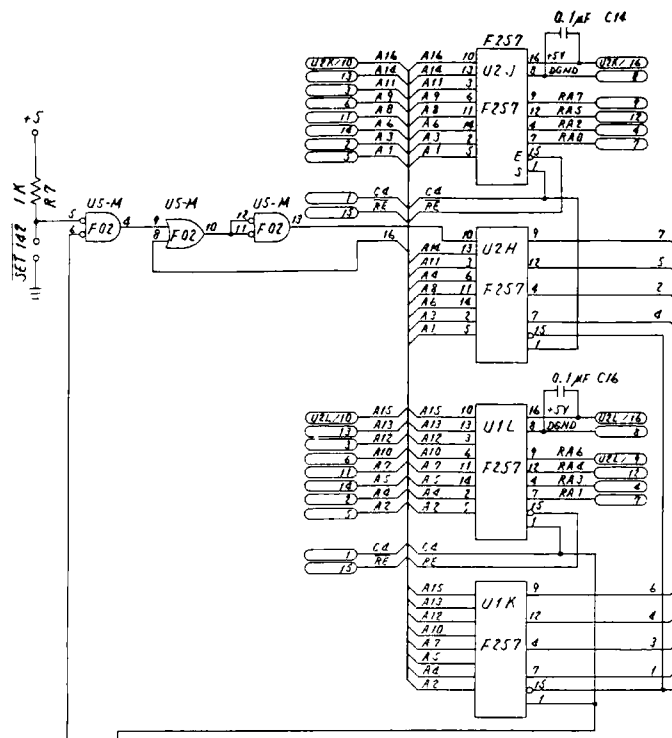
**PIGGYBACK BOARD****PARTS LIST — PCB ASSEMBLY #327139****C — Indicates Commodore Stocked Part Number**

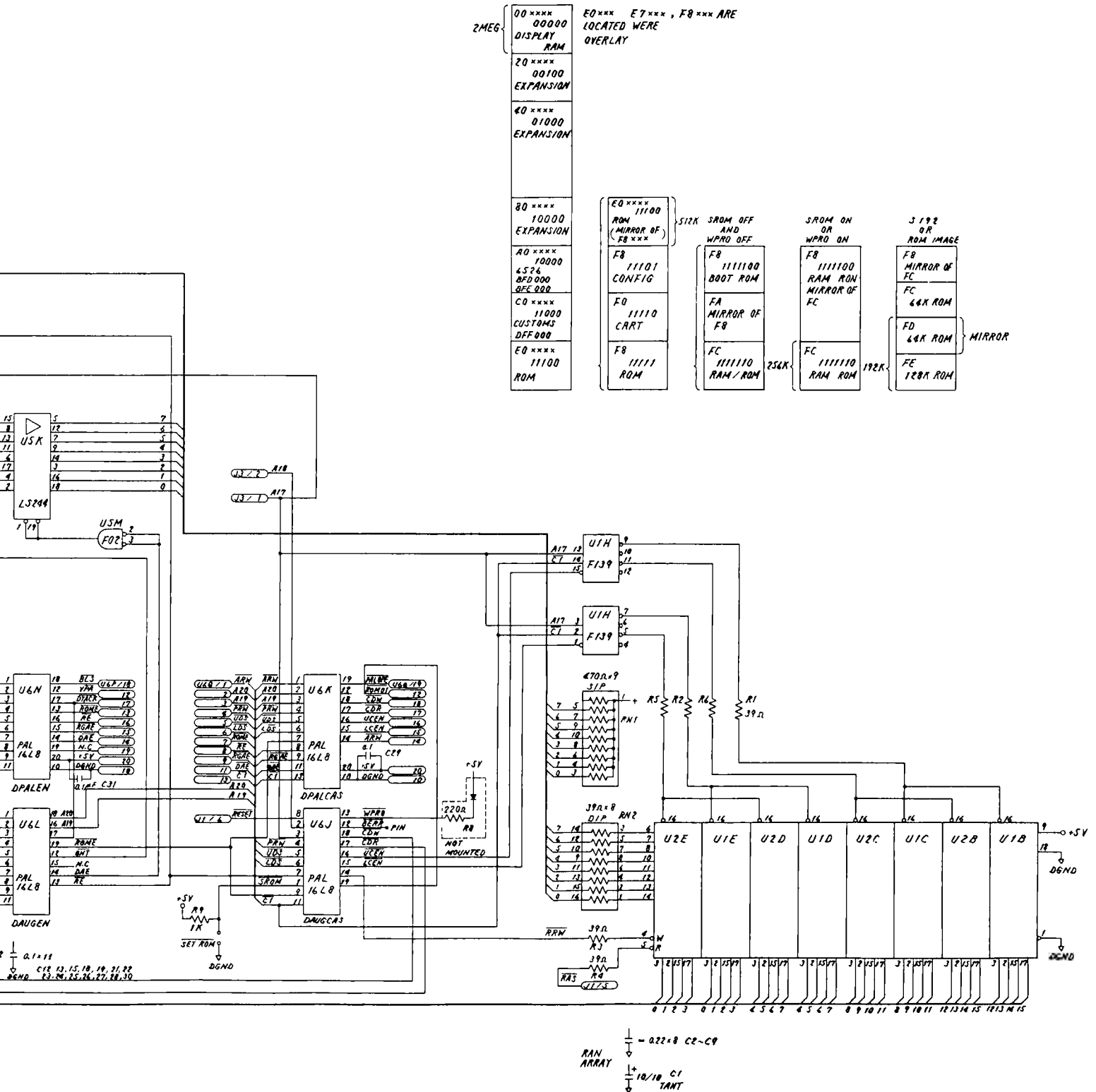
<b>INTEGRATED CIRCUITS</b>		<b>RESISTOR PACKS</b>	
U1B-U1E	DRAM 256K 15OnS	RN1	SIP, 470Ω, 1/8 W 9 pin
U1H	74F139 Dual 1 of 4 Decoder	U2F	DIP, 39Ω
U1K, U1L	74F257 Multiplexer	<b>CAPACITORS</b>	
U2B-U2E	DRAM 256K 15OnS	C1	Tantalum 10μF 10V 20%
U2H, U2J	74F257 Multiplexer	C2-9	Monolithic 0.22μF 50V
U2K,U2L	Refer to CONNECTORS	C10-11	Electrolytic 100μF 16V 20%
U3J, U3L	74LS244 Octal Buffer	C12-31	Monolithic 0.1μF 50V
U3K, U3H	Refer to CONNECTORS	<b>CONNECTORS</b>	
U4H	74LS373 Transparent Latch	J1	Gold Female Top Entry Type C
U4J	74LS244 Octal Buffer	J1	6 pin Molex 4455CC6
U4K	74LS373 Transparent Latch	J2	4 pin Molex 4455CC4
U4L, U5K	74LS244 Octal Buffer	J3	2 pin Molex 4455CC2
U5L	74LS393 Dual Module Cntr.	U2K, U2L	8 pin Molex 4455CC8
U5M	74F02 Quad NOR	U3K, U3H,	10 pin Molex 4455CC10
U6J	PAL DAUG CAS C252128-04	U6P, U6Q	
U6K	PAL CAS C252128-02		
U	PAL DAUG EN C252128-03		
U	PAL EN C252128-01		
U	Refer to CONNECTORS		
<b>RESISTORS</b> — All values are in ohms- 1/4 W with a 5% tolerance unless noted otherwise.			
R1-6	39		
R7-9	1K		

# PIGGYBACK BOARD

PCB ASSY #327139







## PARTS LIST — PCB ASSEMBLY #327137

INTEGRATED CIRCUITS		RESISTORS — All values are in ohms- 1/4 W with a 5% tolerance unless noted otherwise.			
U1B,C,D,E	64K x 4 DRAM 256K BIT 15ONS	R1	360	R71	8060 1%
U1H,I	74F138 1 of 8 Decoder sub:	R2	1K	R72	287 1%
	74S138 1 of 8 Decoder	R3	360	R73	1150 1%
U1J	74F399 MUX Latch	R4,5	1K	R74	100 1%
U1M	74LS157 Multiplexer	R6	47	R75	49.9 1%
U2B,C,D,E	64K x 4 DRAM 256K BIT 15ONS	R7,8	100	R76	287 1%
U2H	74F374 Octal Latch sub:	R9	75	R77	1150 1%
	74AS374 Octal Latch	R10	220	R78	100 1%
U3H,J	74LS373 Transparent Latch	R11	75	R79	49.9 1%
U4A	8362 DENISE C 252126-01	R12	220	R80	47
U4C	8361 AGNUS C 252125-01	R13,14	1K	R81,82	10K
U4E	8364 PAULA C 252127-01	R15	470	R83,84	360
U4H	74F74 D Flip-Flop sub:	R16	75	R85	1100 1%
	74AS74 D Flip-Flop	R17-22	47	R86	1150 1%
U4J	74LS244 Octal Buffer	R23-25	75 1%	R87	750
U4M	LM2901 Quad Comparator sub:	R26		R88,89	36K
	TA75339 Quad Comparator	R27	10K	R90	750
U5A	74HC244 CMOS Octal Buffer	R28,29	33	R91,92	3.3K
U5G	LF347 Quad Op-Amp sub:	R30,31	47	R93	36K
	μA4048 Quad Op-Amp	R32,33	3.3K	R94,95	100
U5N	ROM Bootstrap EVEN C 252179-01	R34-36	33	R96	36K
U5P	ROM Bootstrap ODD C 252180-01	R37	910	R97,98	3.3K
U6A	74HC244 CMOS Octal Buffer	R38-42	47	R99	0.47
U6K	LM1488 RS-232 Driver	R43	1K		sub: 0.5
U6L	LM1489A RS-232 Receiver	R44	220	R100	1K
U6M	74LS32 Quad OR Gate	R45	1K	R101	1M
U6N,P	8520 CIA C 318029-01	R46	3.3K	R102	10K
U6S	68000 CPU 8MHZ/10MHZ/12.5MHZ	R47	1K	R103,104	1K
U7A	MC1377 RGB to NTSC	R48	3.3K	R105	100K
U7M	74LS04 Hex Inverter	R49	1K	R106	22K
U7N	7407 Hex Buffer O.C.	R50,51	3.3K	R107	33
U7P	7438 Quad NAND O.C.	R52	1690 1%	R108	200
U7R	7407 Hex Buffer O.C.	R53	1000 1%	R109	470
U8G,H,I	74F74 D Flip-Flop sub:	R54	2000 1%	R110	1.5 1/2W
	74AS74 D Flip-Flop	R55	4020 1%		5%
U9G,I	74S51 Dual A/O/I Gate	R56	8060 1%	R111,112	1K
TRANSISTORS		R57	287 1%	R113	39
Q1,2,3	NPN 2SC 3504 (Sanyo)	R58	1150 1%	R114,115	1
Q4,5	NPN 2SC 945A (NEC)	R59	100 1%	R116-119	220
Q8	NPN 2SC 752G (Toshiba)	R60	49.9 1%	R120	150
Q9	PNP 2SB 825 (Sanyo)	R61	560	R121,122	1
Q10	NPN 2SC 945A (NEC)	R62	1.2K	R123-126	220
Q18	PNP 2SA 733 (NEC) sub:	R63	3920 1%	R127	150
	PNP 2SA 564 (Matsushita) sub:	R64	1000 1%	R128-133	39
	PNP 2SA 608 (Sanyo)	R65	2000 1%	R134	47
DIODES		R66	4020 1%	R135	3920 1%
CR2	IN4148 sub:	R67	8060 1%	R136-139	470
	1S1588	R68	1000 1%	R140	220K
		R69	2000 1%	R141	10
		R70	4020 1%	R142	10K

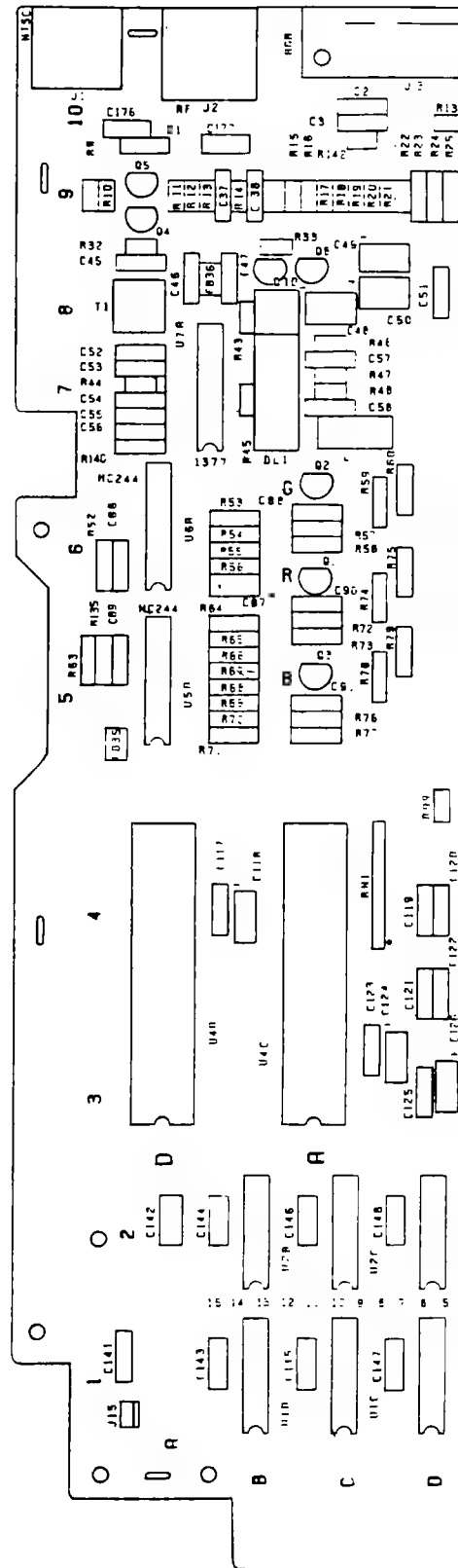


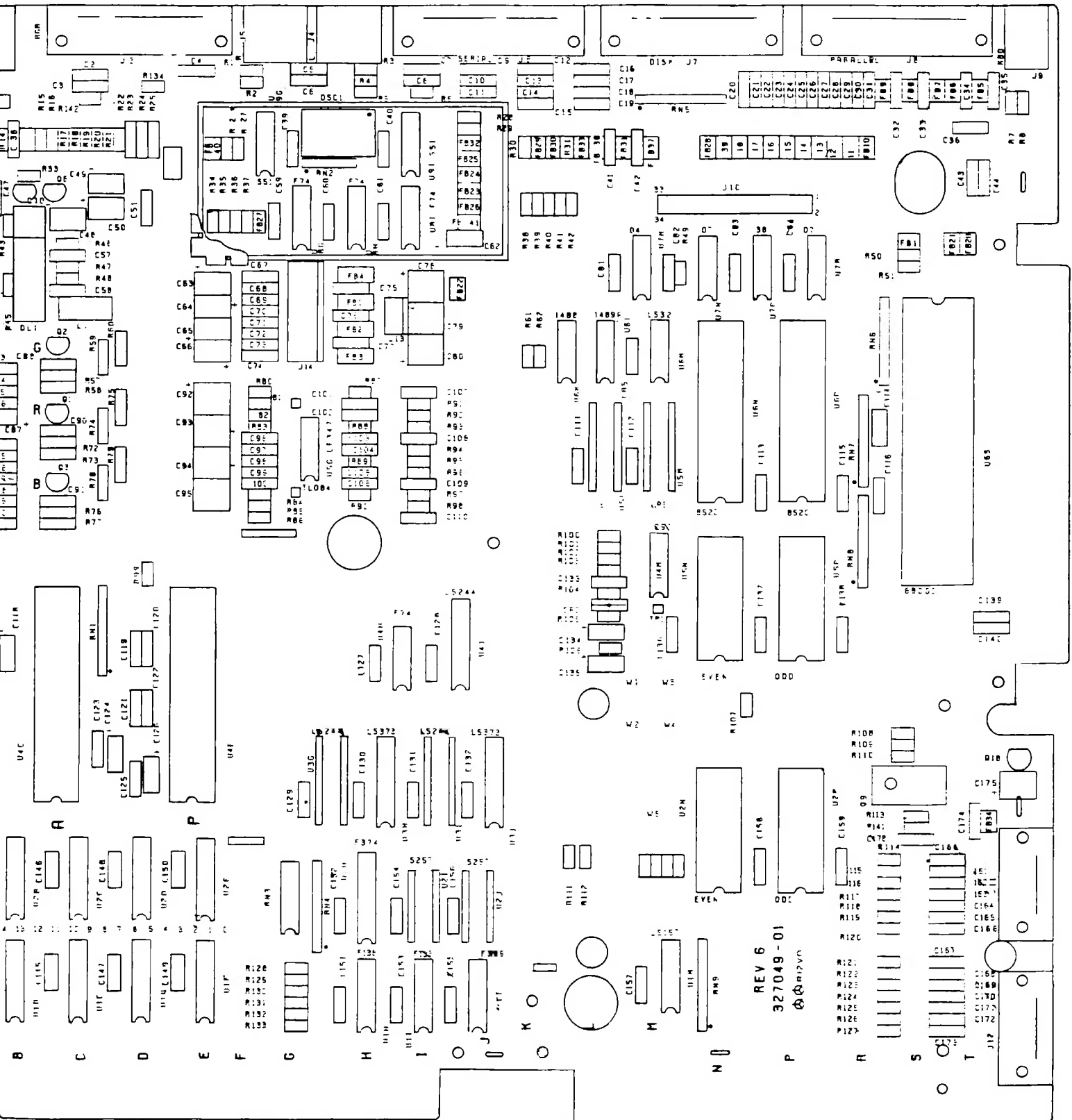
**PARTS LIST — PCB ASSEMBLY # 327137 (Continued)**

<b>RESISTOR PACKS</b>				<b>CAPACITORS (Continued)</b>			
RN1	1K	1/10w	SIP 10 pin pin 1 common	C74	MONO	1000pF	50V
RN2	1K		SIP 6 pin pin 1 common	C75-77	MONO	0.1 $\mu$ F	50V
RN3	39		DIP 16 pin isolated	C78-80	ELECT	100 $\mu$ F	16V
RN4	470	1/8w	SIP 10 pin pin 1 common	C81-86	MONO	0.1 $\mu$ F	50V
RN5	1K	1/10w	SIP 10 pin pin 1 common	C87	TANT	10 $\mu$ F	10V 20%
RN6	10K	1/8w	SIP 10 pin pin 1 common	C88	MONO	0.01 $\mu$ F	50V
RN8	2.7K	1/8w	SIP 10 pin pin 1 common	C89	MONO	0.1 $\mu$ F	50V
RN9	100K	1/10w	SIP 10 pin pin 1 common	C90,91	MONO	0.01 $\mu$ F	50V
<b>CAPACITORS</b>				C92	ELECT	47 $\mu$ F	16V (REV.A)
C1	MONO	0.1 $\mu$ F	50V		ELECT	100 $\mu$ F	16V (REV.6)
C2-4	MONO	0.01 $\mu$ F	50V	C93	ELECT	220 $\mu$ F	16V (REV.A)
C5,6	MONO	0.1 $\mu$ F	50V		ELECT	100 $\mu$ F	16V (REV.6)
C7-15	MONO	1000pF	50V	C94	OMITTED		(REV.A)
C16	MONO	0.01 $\mu$ F	50V		ELECT	100 $\mu$ F	16V (REV.6)
C17-19	MONO	1000pF	50V	C95	ELECT	470 $\mu$ F	16V
C20,21	MONO	0.01 $\mu$ F	50V	C96-100	MONO	0.1 $\mu$ F	50V
C22	MONO	1000pF	50V	C101	MONO	0.01 $\mu$ F	50V
C23-35	MONO	470pF	50V	C102	MONO	0.0047 $\mu$ F	50V
C36	MONO	0.01 $\mu$ F	50V	C103,104	MONO	220pF	50V
C37-40	MONO	0.1 $\mu$ F	50V	C105	MONO	0.0047 $\mu$ F	50V
C41,42	MONO	0.01 $\mu$ F	50V	C106	MONO	0.01 $\mu$ F	50V
C43,44	MONO	1000pF	50V	C107	MONO	0.047 $\mu$ F	50V
C45	MONO	47pF	50V	C108,109	MONO	0.01 $\mu$ F	50V
C46	MONO	0.1 $\mu$ F	50V	C110	MONO	0.047 $\mu$ F	50V
C47	MONO	1000pF	50V	C111-113	MONO	0.1 $\mu$ F	50V
C48-50	ELECT	22 $\mu$ F	25V	C114	TANT	10 $\mu$ F	10V 20%
C51	MONO	0.01 $\mu$ F	50V	C115-117	MONO	0.1 $\mu$ F	50V
C52,53	MONO	0.1 $\mu$ F	50V	C118	TANT	10 $\mu$ F	10V 20%
C54	MONO	100pF	50V	C119-122	MONO	0.047 $\mu$ F	50V
C55-57	MONO	0.01 $\mu$ F	50V	C123	MONO	0.1 $\mu$ F	50V
C58	MONO	47pF	50V	C124	TANT	10 $\mu$ F	10V 20%
C59-61	MONO	0.1 $\mu$ F	50V	C125	MONO	0.1 $\mu$ F	50V
C62	TANT	10 $\mu$ F	10V 20%	C126	TANT	10 $\mu$ F	10V 20%
C63-66	ELECT	22 $\mu$ F	25V	C127-133	MONO	0.1 $\mu$ F	50V
C67	MONO	0.1 $\mu$ F	50V	C134,135	TANT	10 $\mu$ F	10V 10%
C68	MONO	1000pF	50V	C136-138	MONO	0.1 $\mu$ F	50V
C69	MONO	0.1 $\mu$ F	50V	C139,140	MONO	0.01 $\mu$ F	50V
C70	MONO	1000pF	50V	C141	MONO	1000pF	50V
C71	MONO	0.1 $\mu$ F	50V	C142	TANT	10 $\mu$ F	10V 20%
C72	MONO	1000pF	50V	C143-150	MONO	0.22 $\mu$ F	50V
C73	MONO	0.1 $\mu$ F	50V	C151-159	MONO	0.1 $\mu$ F	50V
				C162-166	MONO	1000pF	50V
				C169-173	MONO	1000pF	50V
				C174	MONO	0.01 $\mu$ F	50V
				C175	ELECT	100 $\mu$ F	16V
				C176,177	MONO	470pF	50V
				C178	MONO	0.1 $\mu$ F	50V

**PARTS LIST — PCB ASSEMBLY #327137 (Continued)**

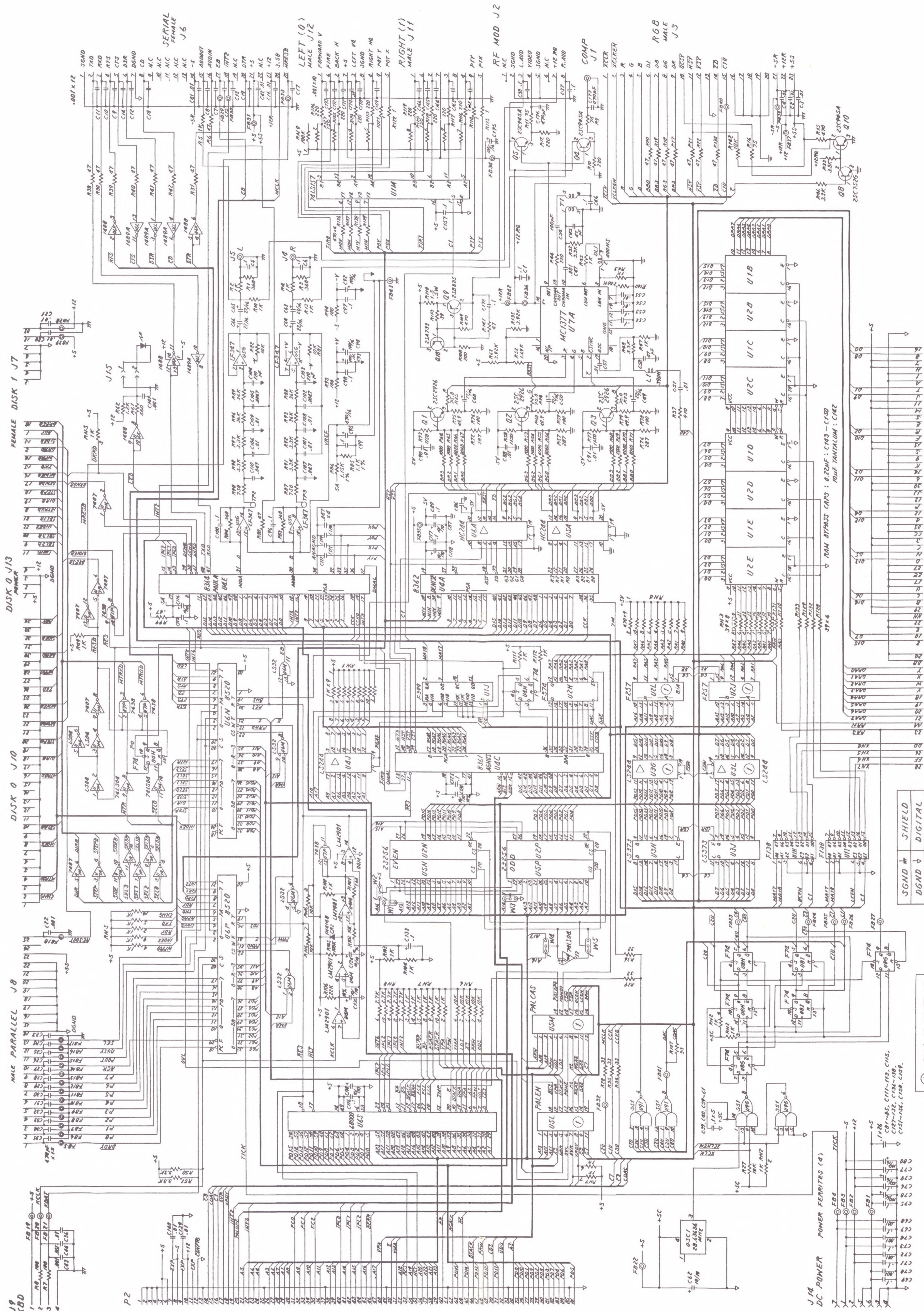
<b>CONNECTORS</b>		<b>CONNECTORS (Continued)</b>	
J1	RCA Jack, Yellow	U2I,J	Header Assy 2.54 pitch, 8 pin
J2	8 Pin Din C 325573-01	U3G,I	Header Assy 2.54 pitch, 10 pin
J3	D-Sub, 23 Pin Male, Rt Angle TRW	U5L,M	Header Assy 2.54 pitch, 10 pin
M59-23-20-738P-3		<b>MISCELLANEOUS</b>	
J4	RCA Jack, Red	DL1	Delay Line 400 nS TDK DL122401D-1533
J5	RCA Jack, White		sub: Toko H321LNP-1436PBAB
J6	D-Sub, 25 Pin Female, Rt Angle TRW	FB1-4	Power Ferrites
M59-25-30-435S-4		FB5-43	Ferrite Beads
J7	D-Sub, 23 Pin Female, Rt Angle TRW	L1	Coil Inductor 39 $\mu$ H 10%
M59-23-30-435S-4		OSC1	Crystal Module
J8	D-Sub, 25 Pin Male, Rt Angle TRW		28.63636 MHZ 25ppm C 325566-12
M59-25-30-738P-3			sub: 28.63636 MHZ 15ppm C 325566-14
J9	RJ11 PCB Mtg Cnnct Rt Angle Gold Plt Molex 90077-1040	T1	Chroma Bandpass Transformer Toko 166NNF-10264AG
J10	Header Assy 2.54 pitch, 34 pin		RF Shield Box C 327044-01
J11,12	D-Sub, 9 Pin Male, Rt Angle TRW M59-09-30-837P		RF Shield Top C 327045-01
J13	Header Assy 2.54 pitch, 4 pin		
J14	Header Assy 3.96 pitch, 7 pin		
J15	Header Assy 2.54 pitch, 2 pin		





BOARD LAYOUT  
AMIGA MAIN LOGIC PCB ASSY #327137





AMIGA MAIN LOGIC PCB ASSY #327137



## CBM APPROVED VENDORS FOR GENERIC PARTS

Component parts are stocked by Commodore if they are custom, proprietary or difficult to obtain in the field. Those common components that are available from many sources are considered **GENERIC** and are best obtained from your local parts distributor. Often critical parameters may vary between manufacturers and will affect the performance of a product. It is strongly **RECOMMENDED** that you use only parts from vendors that have been qualified and **APPROVED** by Commodore for use in our products. If you have a board with **ORIGINAL** parts and the vendor is not listed as approved, you may assume that the vendor was approved after this printing and also may be used as a replacement part.

RAM		64K X 4 BIT DYNAMIC RAM		
ACCESS TIME	HITACHI	FUJITSU	NEC	
150 nS	HM50464P-15	MB81464-15	D41464C-15	
CPU		68000 MICROPROCESSOR		
	HITACHI	MOTOROLA	ROCKWELL	SIGNETICS
8 MHZ	68000L8	68000L8	R68000P8	SCN68000C8N64
10 MHZ	68000L10	68000L10	X	X
12.5 MHZ	68000L12	68000L12	X	X

### TTL DEVICES

7407	T.I., NATIONAL, SIGNETICS, MOTOROLA
7438	T.I., NATIONAL, SIGNETICS, MOTOROLA
74AS74	T.I.
74AS374	T.I.
74F02	FAIRCHILD
74F74	FAIRCHILD
74F138	FAIRCHILD
74F139	FAIRCHILD
74F257	FAIRCHILD
74F374	FAIRCHILD
74F399	FAIRCHILD
74HC244	T.I., NATIONAL, TOSHIBA
74LS04	T.I., NATIONAL, SIGNETICS, MOTOROLA
74LS32	T.I., NATIONAL, SIGNETICS, MOTOROLA
74LS157	T.I., NATIONAL, SIGNETICS, MOTOROLA
74LS244	T.I., NATIONAL, SIGNETICS, MOTOROLA
74LS373	T.I., NATIONAL, SIGNETICS, MOTOROLA
74LS393	T.I., NATIONAL, SIGNETICS, MOTOROLA
74S51	T.I., NATIONAL, SIGNETICS
74S138	T.I., NATIONAL, SIGNETICS, MOTOROLA

### LINEAR AND MISCELLANEOUS CHIPS

	T.I.	NATIONAL	MOTOROLA	TOSHIBA
1377	X	X	MC1377	X
1488	SN75188	LM1488	MC1488	X
1489A	SN75189	LM1489A	MC1489	X
2901	X	LM2901	X	X
347	X	LF347N	LF347N	X
75339	X	X	X	TA75339

